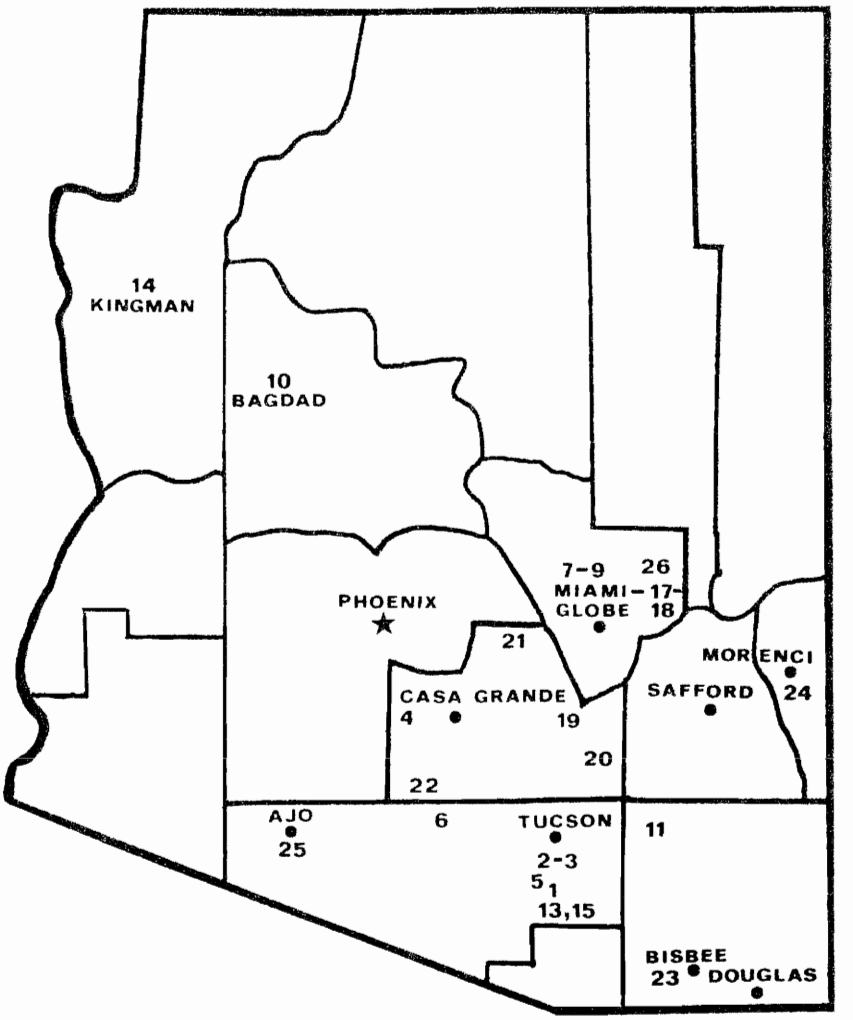
THE PRIMARY COPPER INDUSTRY OF ARIZONA IN 1985

SPECIAL REPORT NO. 10



BY

RICHARD R. BEARD
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ARIZONA DEPARTMENT OF
MINES AND MINERAL RESOURCES

ERRATA - THE PRIMARY COPPER INDUSTRY OF ARIZONA IN 1985

Page 1

Last sentence of second paragraph should read:

By-products of the copper mines (gold, silver and molybdenum) contributed approximately 7.5% more which makes the contribution of the copper mines more than 81% of the total.

Table XXIII

Add:

Company - Freeport McMorRan
Deposit - Santa Cruz
Major Mineral Type - Oxide
Millions of Tons - 800
Average Copper Content - .43
Remarks - 50% joint venture with ASARCO

ABOUT THE COVER

The producing copper mines and operations listed below correspond to the locations and numbers on the cover.

COMPANY
#. Mine

ANAMAX MINING COMPANY
1. Twin Buttes
2. Eisenhower

ASARCO INCORPORATED
2. Eisenhower
3. Mission Complex
4. Sacaton
6. Silver Bell

CYPRUS MINES CORP.
10. Bagdad
11. Johnson

DUVAL
13. Esperanza
14. Mineral Park
15. Sierrita

INSPIRATION CONSOLIDATED COPPER CO.
16. Christmas
17. Inspiration Mines

KENNECOTT CORPORATION
19. Ray

MAGMA COPPER CO.
20. San Manuel
21. Superior

NORANDA LAKESHORE MINES, INC.
22. Lakeshore

PHELPS DODGE CORP.
23. Copper Queen Branch
24. Morenci Branch
    Metcalf Mine
    Morenci Mine
25. New Cornelia

PINTO VALLEY COPPER CORP.
7. Copper Cities
8. Miami Mine
9. Pinto Valley

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Special Report Number 10

By

Richard R. Beard, Mining Engineer

October 1986

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

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ACKNOWLEDGEMENT

The author wishes to express his sincere appreciation to the management and staff of each of Arizona's mining companies for graciously devoting time and effort to provide information for this report during this period when the survival of their industry requires their constant attention.

Lorraine Burgin of the U.S. Bureau of Mines, Dr. George Leaming of the Western Economic Analysis Center of Marana, Arizona and the American Bureau of Metal Statistics, Inc. of Secaucus, New Jersey also provided vital information.

Thanks are also due to the Arizona Department of Economic Security, the Arizona Department of Revenue and the staff of the Joint Legislative Budget Committee for providing statistics and data.

A special gratitude is felt toward Clifford J. Hicks and the preceding authors for providing the format and sources of statistical information and to John H. Jett, director of the Department of Mines and Mineral Resources for providing the opportunity to author this report.

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Table of Contents, Cont.

1/ Throughout this report a "ton" means a short ton (2,000 pounds or 0.90718 metric ton).

Certain specific statistics may vary slightly from Table to Table. This is due to differences in their source.

INTRODUCTION

The Arizona Department of Mines and Mineral Resources presents herein a report covering activity in Arizona's copper industry in the calendar year 1985. A brief review of operational highlights reported by the major developers and producers in the State, market and price developments which affected copper production and discussions of Arizona severance taxes on metalliferous minerals are included.

The contained statistical tables include various production, employment, inventory, import/export, prices, costs and ore reserve numbers for 1985. Production of recoverable copper is given for individual mines and by company. Figures showing the importance of copper in the mining industry are furnished, as are data on the by-products of copper mining; gold, silver and molybdenum. In addition, historical compilations are included for leach copper, average grade of ore produced, percent copper recovered, open pit mine stripping ratios, and employment and earnings. Additional compilations indicating refined copper inventories in and out of the United States and average copper prices by month from 1976 through 1985 are provided. Also included are tables showing designed mine capacity and copper reserves in Arizona plus average copper cash production costs for the United States, 1981-1984.

The Department maintains extensive reference libraries in its Phoenix and Tucson offices concerning the copper industry in Arizona. These repositories include information on individual mines and mining companies, United States Bureau of Mines and United States Geological Survey publications, other professional publications and periodicals and earlier editions of this report. Additionally, experienced mining engineers are available for consultation, at no charge, on matters germane to the minerals industry. Office hours are 8 a.m. to 5 p.m. on all non-holiday weekdays.

COPPER PRODUCTION IN ARIZONA -- 1985

Arizona's copper production of 889,167 tons in 1985 is an increase of 7.8% over 1984 but remained below the record production of 1981 by 17.1%. Arizona's share of the United State's total increased by 7.9 percentage points to 73.9%.

The gross value of non-fuel production in Arizona in 1985 was up 3.3% to $1,532,574,000 (preliminary) over 1984 more than offsetting the 2.3% decrease experienced in 1984. Of this total copper production contributed 73.9%. By-products of the copper mines (gold, silver, and molybdenum) contributed approximately 7.5% more than 81% of the total.

Copper was produced from fifteen major mines in 1985. Molybdenum was recovered as a by-product at six of these copper mines. Eight mines produced 96.8% of Arizona's 1985 copper output and three produced 91.5% of the molybdenum. The Morenci-Metcalf mine of Phelps Dodge led in copper production with 29% of the total and Duval's Sierrita-Esperanza complex produced 64% of the molybdenum.

Copper produced by leaching methods in 1985 amounted to almost 267 million pounds or 15% of the total.

All eight of the solvent extraction-electrowinning (SX-EW) plants operated for at least part of 1985. Solvent extraction uses a liquid ion-exchange process to purify and increase the concentration of copper in leach solutions. Copper is then recovered from the high grade solution by electrolytic deposition. Some of the advantages of SX-EW over the cementation process are: no smelting is required and therefore no air pollution is produced, there is a net reduction in energy costs and the product is high grade cathode copper which can be marketed directly.

In 1985 stripping operations were conducted simultaneously with ore production at eight open pit mines. The stripping ratios - the amount of waste removed compared to the amount of ore mined - averaged 0.88 to 1. The reduction in stripping ratios resulted principally from improved pit design made possible by the consolidation of operations at some of the major properties.

Sulfide ores were the source of 85% of the copper produced in Arizona in 1985. The weighted average sulfide grade was 0.62% Cu which is down from 0.70% Cu in 1984 and is close to the 0.61% Cu average for the last ten years. This return to normal reflects the increased stability, although still mostly unprofitability, of the copper industry.

Table XII shows an estimate of the capacity to produce primary copper at each of the state's principal operations. The total design capacity is 1.163 million tons annually. The Arizona mines, concentrators and leach facilities operated at 76.5% of capacity in 1985.

Table XIII lists the copper reserve base in Arizona by company and property. The reserve base as defined in "Mineral Facts and Problems" 1985 Edition, Bureau of Mines Bulletin 675, page 3 includes those resources that are currently economic (reserves), marginally economic (marginal reserves) and some of those that are currently sub-economic (sub-economic reserves). The many technical, political, social and economic variables render a listing of actual economic reserves inappropriate.

PROGNOSTICATION

Although there was little change in the copper industry statistics from 1984 to 1985, there was a new feeling of confidence. The disastrous years of 1983 and 1984 can be seen as the demise of an era marked by expanding markets, increasing prices and the accompanying increasing demands of the labor unions whose costs could be absorbed into the revenues.

The new era beginning in 1985 is characterized by hard decisions and tough choices. The goal of most operators still in business has shifted from trying to remain in operation to trying to make a profit. Some companies have broken back into the black ink again. Now with the expected cooperation of organized labor, the goals can shift once more to trying to increase profits to the point that makes investment in new reserves and processes attractive.

It has become apparent that relief cannot be expected by way of price increases. Therefore cost reduction is the only course to profitability. Those companies still in the copper mining business have initiated cost reduction plans which best suit their individual reserves, plants and personnel. Their programs have increased production per man hour and decreased cost per man hour. Some of these programs are redesigns of mine plans, consolidation of operations, improved maintenance of equipment, modernization of processes and the closing of properties deemed uneconomic for the foreseeable future. Perhaps most encouraging however, is the perceived increase in cooperation and reduction of suspicion between labor and management. This is the result of better communications instituted in the battle against the common enemy of bankruptcy. Stockholders, management and labor have been forced to concede that their survival is mutually interdependent.

Arizona's and the nation's leading copper producer, Phelps Dodge, sold an undivided 15% share of its flagship operation at Morenci to Sumitomo to raise capital for processing improvement. Pennzoil consummated the sale of its Arizona copper properties (Duval) to Cyprus Minerals which was itself a spin off from Amoco. This will give Cyprus the potential to become one of the leading copper and molybdenum producers in the nation.

The production of high quality cathode copper from leach solutions by solvent extraction-electrowinning process has proved to be a major factor in keeping some companies afloat. It is no panacea, however, since most of Arizona's copper resource base is comprised of sulfide mineralization which is not readily amenable to leaching.

The always high and generally unpredictable costs of environmental controls and regulations have resulted in a decrease of smelter capacity in Arizona. Phelps Dodge's Ajo and Morenci smelters remain cold and their Douglas smelter will shut down by January 1987. Kennecott's smelter at Hayden also remains cold and the fate of Magma's smelter at San Manuel remains uncertain. It is now operating under a permit, the terms of which cannot be extended beyond January 1, 1988. The excess of concentrates are being exported and with them the jobs.

The relative stability of the copper market, while much lower than would be desired, is in itself an encouraging indicator. Unless some unforeseen event upsets the current trends we can look forward to a generally improving market and an equally expanding production. Those producers who have managed to modernize their equipment, mining methods and management techniques will find the future profitable.

The inescapably bleak area of the current trends is in employment. Although it appears that production and revenues will gradually increase, a commensurate increase in employment is unlikely. Those workers caught in the massive layoffs will not likely be rehired and the creation of new traditional jobs appears remote in the extreme. The highly skilled, technicians are the only ones likely to be in demand.

HIGHLIGHTS OF COMPANY OPERATIONS IN ARIZONA

ANAMAX MINING COMPANY

Anamax Mining Company is an equal partnership between Anaconda Minerals Company, a wholly owned subsidiary of the Atlantic Richfield Company and AMAX Incorporated. The company owns the Twin Buttes open-pit mine and controls the Palo Verde ore reserves under a lease from the State of Arizona. An agreement is in effect with ASARCO Incorporated for mining the Palo Verde deposit. Anamax is an equal partner with ASARCO in the Eisenhower Mining Company which mines the Palo Verde deposit. Anamax's share of Eisenhower ore is processed at the Twin Buttes mill.

"Under the terms of a consent order issued by the Federal Trade Commission on October 29, 1979, in an administrative proceeding in which it had challenged the acquisition of common stock of the Anaconda Company by Atlantic Richfield and the subsequent merger between the companies, the Company is required to divest most of its interest in Anamax by October 1984, the consent order provides for the appointment of a trustee with concurrent authority to solicit for the sale of the interest at fair value during the following three years. Anamax suspended sulfide mining at the Twin Buttes mine on January 31, 1983". 1/

The Twin Buttes mine remained closed during 1985. Stockpiled oxide ore was treated in the Oxide Plant by agitation leach, solvent extraction and electrowinning. A resin ion exchange section extracted uranium values prior to the solvent extraction of the copper values. The Oxide Plant was shut down in September 1985 and all production from Twin Buttes has ceased. All mining and milling equipment has been sold.

1/ Atlantic Richfield Company Annual Report on Form 10-K, 1983, pp 708.

ASARCO, INCORPORATED

With the acquisition of the Pima mine from Cyprus Pima Mining Co. in September 1985, Asarco consolidated operation of the entire Mission-Eisenhower-San Xavier-Pima open pit as the Mission Complex. In addition to increasing their reserves the acquisition will facilitate more efficient operation of the mine.

The Silver Bell mine and concentrator remained shut down throughout 1985. All production came from the dump leaching and cementation operation.

Activity at the permanently closed Sacaton open pit consisted of covering the tailings with soil and revegetating the tailings and dumps.

Operation of the INCO flash furnace and the acid plant at the Hayden smelter continued throughout the year. This smelter operates as a custom smelter and smelts Asarco concentrates as well as concentrates from Kennecott's Ray Mines Division.

CYPRUS MINERALS COMPANY

"Effective July 1, 1985 Amoco Corporation spun off to its shareholders, in a tax free distribution, all of the shares of Cyprus Minerals Company, which conducted all of Amoco's majority owned minerals operations". 1/

At the Pima mine, the mill and all mining equipment are being disposed of and the reserves have been sold to Asarco.

Cyprus Johnson mined no new ore during 1985 but continued leaching the heaps. Copper was extracted from the leach solutions by SX-EW.

Cyprus Bagdad operated at capacity throughout 1985 and ranked fourth in copper production and second in molybdenum production in Arizona.

In 1986 Cyprus consummated a deal for the purchase of Duval's Arizona copper-molybdenum properties from Pennzoil Company.

1/ Amoco Corporation Annual Report, Form 10-K, 1985, p. 2.

DUVAL CORPORATION

Duval Corporation's parent company, Pennzoil Company, continued to seek a buyer for Duval's Arizona properties during 1985. To facilitate a sale the company instituted stringent cost control measures at its Sierrita pit and has maintained the Esperanza and Mineral Park properties on standby status with production only from dump leaching.

"In connection with the decision to discontinue the metals mining business, in 1984 the Board of Directors authorized a writedown of $100 million ($67 million after tax) of the related metals assets to estimated net realizable values, including estimated future costs and operating results to the anticipated disposal date. Because of the further deterioration in base metals markets, particularly molybdenum, and the status of ongoing negotiations for the sale of the copper-molybdenum properties during 1985 which have led to a lower estimate of net realizable value than in 1984, the Board of Directors authorized an additional writedown of $123 million ($75 million after tax) in 1985." 1/

In 1986 Pennzoil consummated a deal selling all of its Arizona copper-molybdenum properties to Cyprus Mineral Company.

1/ Pennzoil Company 1985 Annual Report on Form 10-K, p. 27.

EISENHOWER MINING COMPANY

The Anamax Mining Company and ASARCO Incorporated are equal partners in the Eisenhower Mining Company which was formed to develop the Palo Verde deposit. Mining of the deposit under the joint venture agreement is expected to reduce operating costs greatly for both companies and to lengthen the life of the Mission and San Xavier mines significantly by eliminating some pit slopes and recovering ore that would ordinarily have to be left along property lines. The agreement contains provisions governing the amount of ore each partner will receive, the timing of ore delivery and allocation of costs between the partners.

Asarco purchased Anamax's share of the Palo Verde reserves in 1986.

INSPIRATION CONSOLIDATED COPPER COMPANY/INSPIRATION MINES INC.

As a result of a reorganization effective July 6, 1983, Inspiration Consolidated Copper Company/Inspiration Mines Inc., became a unit of a parent holding company, Inspiration Resources Corporation (formerly Plateau Holdings Inc.). Inspiration Resources Corporation now owns all of the Common Stock and 97% of the Class A Preferred Stock of Inspiration Consolidated Copper Company. The remaining 3% is held by fewer than 300 shareholders. The termination of registration of such stock with the Securities and Exchange Commission took effect on January 25, 1984. Inspiration Consolidated Copper/Inspiration Mines conducts Inspiration Resources United States' metals business, while another unit, Hudson Bay Mining and Smelting Company, Ltd. now operates their Canadian metals business.

Inspiration's operations in the Miami, Arizona area include the T.J. Pit (Thornton & Joe Bush), the L.R. Pit (Live Oak & Red Hill), the Oxhide and the Bluebird collectively called "Inspiration Mines".

The company announced plans to temporarily shut down its sulfide mining and concentrator and move to an all leach and SX-EW operation. Lower grade oxide ore is dump leached and the higher grade oxide ore and certain sulfide ores are leached by the patented ferric cure process. Although the percent recovery is lower, the overall cost per pound of copper produced by leaching is significantly less than for sulfide ores using conventional methods. The tank house and rod plant will continue normal operations and the smelter will continue at normal levels treating stockpiled, purchased and tolled concentrates.

The Christmas property remained inactive throughout 1985.

KENNECOTT MINERALS COMPANY

The Kennecott Minerals Company is a wholly owned subsidiary of the Standard Oil Company of Ohio (Sohio). Fifty-three percent of Sohio is owned by a subsidiary of the British Petroleum Company.

The Ray Mines Division (Arizona) includes an open pit mine, a silicate plant consisting of vat leach-solvent extraction-electrowinning and a dump leach-precipitation operation. The sulfide ore concentrator, smelter and acid plant are located at Hayden, Arizona. The division was shut down from May 1982 until September 1983 and the smelter remains shut down. The mine and the concentrator have been operating at close to full capacity since that time and the silicate plant started operations in December 1985. Mill concentrates are sold to ASARCO at its Hayden smelter.

MAGMA COPPER COMPANY

As Newmont Mining Company's largest subsidiary, Magma operates an underground block-caving mine, concentrator, smelter, sulfuric acid plant, electrolytic refinery and a continuous rod casting plant at San Manuel, Arizona. Their underground mine and concentrator at Superior, Arizona was shut down in August 1982 and remained on care and maintenance status until 1985 when it was permanently closed. Development work on the Kalamazoo ore body which is adjacent to but deeper than the San Manuel deposit was suspended in 1981 as a cost reduction measure. Since June of 1984 the smelter at San Manuel has been treating the concentrates from Newmont's Pinto Valley subsidiary in addition to those from San Manuel.

During 1985 Magma started construction of a $70 million heap leach-solvent extraction-electrowinning project to produce copper from oxide ore mined by open pit methods. The oxide ore body overlays the San Manuel sulfide deposit. The project started production in 1986 and costs are expected to be about half of the 1985 cost of producing copper from the sulfide ore.

A commercial scale test is planned for in-situ leaching of the oxide ore in the caved area overlying the mined out area of the sulfide ore body.

NORANDA LAKESHORE MINES, INC.

Noranda Lakeshore Mines, Inc. is a wholly owned subsidiary of Noranda Mines Ltd. of Canada. The mine is located 28 miles southwest of Casa Grande, Pinal County, Arizona, on the Papago Indian Reservation.

All underground development was suspended in April 1982, but a successful test program resulted in the development and construction of a full-scale in situ leach facility designed to extract copper from the broken low grade oxide ore remaining from the mined out block cave operation.

Underground mining and vat leaching at Lakeshore was terminated in late 1983 and replaced by in situ leaching. Pregnant solutions are pumped from collection sumps and dams to the surface for distribution to the solvent extraction-electrowinning plant.

PHELPS DODGE CORPORATION

Phelps Dodge has five copper units in Arizona: 1) The Morenci Branch is comprised of the Morenci-Metcalf open pit mine, two concentrators, precipitation plant for dump leach solutions, smelter and acid plant. 2) The New Cornelia Branch at Ajo includes an open pit mine, concentrator, dump leach-precipitation operation, smelter and acid plant. 3) The Copper Queen Branch at Bisbee consists of a precipitation plant to treat leach solutions from the Lavender Pit and dumps. 4) The Douglas Reduction Works is a smelter rated at 700,000 tons of input but severely restricted by environmental controls. 5) The Safford Branch is a low grade sulfide copper deposit near Safford. Active underground development was suspended in 1982 and in August 1984 it was allowed to flood. The Small Mines Division headquartered at Safford has been discontinued.

Phelps Dodge's flagship operation at Morenci accounted for 29% of Arizona's copper production in 1985. The Morenci smelter remained shut down during 1985 and the oxygen plant was moved to the company's smelter at Hidalgo, New Mexico. In December plans were announced to construct a $90 million solvent extraction-electrowinning plant at Morenci. The initial annual capacity of 35,000 tons is to be increased to 45,000 tons in three years.

An undivided 15% interest in the Morenci operation, excluding the smelter, was sold to Sumitomo Metal Mining Arizona, Inc. a jointly owned subsidiary of Sumitomo Metal Mining Co., Ltd. and Sumitomo Corporation, both of Japan. Sumitomo takes its share of production in kind and may elect to participate in the planned SX-EW facility.

The mine and concentrator at the New Cornelia Branch remained shut down throughout 1985 and the smelter has been shut down since April 1985. A small amount of production was reported as precipitates from dump leaching.

The pumps were turned off and the underground workings at the Copper Queen Branch were allowed to flood.

PINTO VALLEY COPPER CORPORATION

Pinto Valley Copper Corporation, like Magma, is a wholly owned subsidiary of Newmont Mining Corporation. It operates an open pit mine and concentrator and two solvent extraction-electrowinning plants to treat leach solutions at Miami, Arizona. The open pit mine and concentrator operated at full capacity throughout 1985 and the concentrates were shipped to Magma's San Manuel smelter. The leaching and SX-EW plants also continued normal operations throughout the year and the feasibility of initiating in-situ leaching of oxide ore to the north of the Miami underground leach operations is under investigation.
Development of the Miami East underground sulfide copper deposit remained suspended.

CONTACT INFORMATION FOR MAJOR COPPER PRODUCERS

OPERATING IN ARIZONA

September 1986

Anamax Mining Company

Twin Buttes Mine, Box 127, Sahuarita, AZ 85629. Phone (602) 791-2810.

ASARCO Incorporated, 180 Maiden Lane, New York, NY 10038. Phone (212) 669-1000.

Tucson Office, 1150 N. 7th Avenue, P.O. Box 5747, Tucson, AZ 85703. Phone (602) 792-3010.

Hayden Unit, P.O. Box 98, Hayden, AZ 85235. Phone (602) 356-7804.

Mission Unit, P.O. Box 111, Sahuarita, AZ 85629, West Pima Mine Road. Phone (602) 791-2920.

Sacaton Unit, P.O. Box V, Casa Grande, AZ 85222. Phone (602) 836-2171. Located 3 miles northwest of Casa Grande on Maricopa Road.

Silver Bell Unit, Silver Bell, AZ 85270. Phone (602) 622-6751.

Cyprus Mines Corporation, 7000 S. Yosemite St., Englewood, CO 80112. Phone (303) 740-5000.

Cyprus Bagdad Copper Company, P.O. Box 245, Bagdad, AZ 86321. Phone (602) 633-2241

Cyprus Johnson Copper Company, P.O. Box 2108, Benson, AZ 85602. Phone (602) 586-2241. Located 1 1/2 miles north of Highway I-10 via Exit 322.

Cyprus Mineral Park Corporation, P.O. Box 6249, Kingman, AZ 86402. Phone (602) 565-2226. Located 7 miles north of Kingman.

Cyprus Sierrita Corporation, P.O. Box 527, Green Valley, AZ 85622-0527. Phone (602) 791-2950. Located 32 miles south of Tucson.

Inspiration Consolidated Copper Company/Inspiration Mine Inc.

Inspiration, P.O. Box 4444, Claypool, AZ 85532. Phone (602) 473-7000.

Kennecott, Ten Stamford Forum, Stamford, CT 06904. Phone (203) 964-3000.

Ray Mines Division, P.O. Box 9, Hayden, AZ 85235. Phone (602) 356-7811.

Ray, AZ (mine), phone (602) 363-5531.

Magma Copper Company, P.O. Box M, San Manuel, AZ 85631. Corporate Headquarters Phone (602) 385-2201.

San Manuel Division (Same as corporate headquarters above.)

Superior Division, P.O. Box 37, Superior, AZ 85273. Phone (602) 689-2444

Noranda Lakeshore Mines, Inc., P.O. Box C-6, Casa Grande, AZ 85222. Phone (602) 836-2141.

Phelps Dodge Corporation, 300 Park Ave., New York, NY 10022. Phone (212) 940-6400.

Western Operations Office, 2600 N. Central Avenue, Phoenix, AZ 85004-3015. Phone (602) 234-8100.

Douglas Reduction Works, P.O. Drawer E, Douglas, AZ 85607. Phone (602) 365-2441.

Copper Queen Branch, Highway 92, Bisbee, AZ 85603. Phone (602) 432-3621.

Morenci Branch, Morenci, AZ 85540. Phone (602) 865-4521.

New Cornelia Branch, Ajo, AZ 85321. Phone (602) 387-7451.

Safford Branch, Box 151, Safford, AZ 85546. Phone (602) 428-6900.

Pinto Valley Copper Corporation, Box 100, Miami, AZ 85539. Phone (602) 425-7611.

Parent Companies

Atlantic Richfield Company, 515 South Flower St., Los Angeles, California 90071. Phone (213) 486-3511.
(Anaconda Minerals Company, 100% - Anamax Minerals Company, 50%)

Inspiration Resources Corporation, 250 Park Ave., New York, NY 10177. Phone (212) 503-3100.
(Inspiration Consolidated Copper Company/Inspiration Mines, Inc., 100%)

Newmont Mining Corporation, 300 Park Ave., New York, NY 10022. Phone (212) 980-1111.
(Magma Copper Company and Pinto Valley Copper Corporation, 100%)

Noranda Mines Ltd., P.O. Box 45, Commerce Court West, Toronto M5L 1B6, Ontario, Canada. Phone (416) 867-7111.
(Noranda Lakeshore Mines, Inc., 100%)

Standard Oil Company (Ohio), Midland Building, Cleveland, Ohio 44115. Phone (216) 575-4141.
(Kennecott, 100%)

SEVERANCE TAX ON METALLIFEROUS MINERALS

Background

Laws of 1982, Chapter 230 repealed the tax on sales of metalliferous minerals and enacted a severance tax in its place. Under the provisions of the severance tax, metalliferous minerals were to be taxed at the time of production, not at the time of sale. All metalliferous minerals produced after 1982 were to be taxed on the greater of the following two values:

1. The "weighted mineral value" which is essentially the cost of extracting the minerals from the earth and delivering them to the site where they will be processed, or

2. A specified percentage of the old sales tax base.

The severance tax was to be levied on metalliferous minerals at a rate of 2 1/2 percent. Unless otherwise provided by law, the tax was to be administered in the same manner as the sales tax. As a result, severance tax payments were due on the first day of the second month following the month in which the tax accrued. From January 1, 1983 through June 30, 1983, 40 percent of the severance tax was to be distributed in the same manner as the transaction privilege tax (i.e. 25 percent to the cities, 33.6 percent to the counties and 41.4 percent to the state). In subsequent fiscal years, a progressively larger share of the severance tax was to be distributed in the same manner as the transaction privilege tax. The balance of severance tax collections, after making this distribution, was to be deposited each year in the state's general fund. (Effective from and after December 31, 1982.)

Laws of 1983, Chapter 4 changed the due date for payment of the Severance Tax to the twentieth day of the month following the month in which the tax accrues. Taxes were to be delinquent if not received by the Department of Revenue on the day preceding the last day of the month in which they were due. (Effective April 1, 1983). The law also changed the interest rate on delinquent tax payments to equal the rate established by Section 6621 of the Internal Revenue Code, compounded annually. (Effective February 11, 1983.)

Legal Citation

A.R.S. 42-1461 - 42-1466.

Paid by

Persons engaged in the business of extracting substances from the earth that become metalliferous minerals (A.R.S. 42-1461 - 42-1462.)

Exemptions

None.

Severance Tax on Metalliferous Minerals
Continued

Tax Base

The severance tax is levied on the "net severance base" of all metalliferous minerals produced after 1982. (42-1462) The "net severance base" is the greater of the following two values (42-1464, Laws of 1982, Chapter 230, Section 12):

1. The "weighted mineral value", or

2. A specified percentage of the old sales tax base (the gross value of production less out-of-state processing costs). This value will be referred to as the "Arizona value" after June 30, 1985.

The "weighted mineral value" is essentially the cost of extracting the minerals from the earth and delivering them to the site where they will be processed.

The "weighted mineral value" is determined using the following formula (42-1464):

$$\text{weighted mineral value} = \frac{\text{mining costs}}{\text{total production costs}} \times \text{gross value of production}$$

where:

mining costs represent the cost of extracting the minerals from the earth and delivering them to the site where they will be processed further (42-1461).

total production costs include most of the major costs incurred in mining and processing minerals until the point of sale (42-1461).

gross value of production is determined by multiplying the recoverable units of a metallic product by the per unit price of the product; the price per unit does not include the cost of manufacturing, fabricating or otherwise transforming a refined mineral product, when these activities occur prior to sale of the product (42-1461).

Although metalliferous minerals will no longer be taxed on the old sales tax base, the value of minerals produced after 1982 may not fall below a specified percentage of the old tax value. (42-1464, Laws of 1982, Chapter 230, Section 12). The old tax value included not only the cost of extracting the minerals from the earth, but most of the major in-state costs of producing the minerals. This value was determined by multiplying the recoverable units of a metallic product by the per unit price and deducting the out-of-state processing costs from the result. (42-1464; Laws of 1982, Chapter 230, Section 12; 41-1461). The following table shows the minimum percentage of the old tax value that may be assigned to minerals for severance tax purposes. (42-1464; Laws of 1982, Chapter 230, Section 12):

Severance Tax on Metalliferous Minerals
Continued

Period during which minerals are produced	Minimum value of minerals for purposes of determining the severance tax
January 1, 1983 - June 30, 1983	100% of the old taxable sale value
July 1, 1983 - June 30, 1984	83-1/3% of the old taxable sale value
July 1, 1984 - June 30, 1985	66-2/3% of the old taxable sale value
July 1, 1985 and thereafter	50% of the old taxable sale value

Tax Rate

During fiscal years 1980-81, 1981-82 and 1982-83, businesses that produced mineral products were permitted to claim a tax credit against the Special Excise Tax for Education. The tax credit was determined by formula (see "TAX CREDIT" under "SPECIAL EXCISE TAX FOR EDUCATION"). The tax credit could not exceed the taxpayer's Special Excise Tax liability for the year. However, if a taxpayer had an unused amount of credit for any year in which his production was curtailed due to economic conditions, the unused credit could be carried forward for a period not to exceed three years. Since the Special Excise Tax does not apply to metalliferous minerals after December 31, 1982, businesses that produce metalliferous minerals are authorized to claim this tax credit against their severance tax liability, beginning in 1983. In 1982-83, the amount of credit claimed may not exceed 40 percent of the taxpayer's severance tax liability. (Laws of 1982, Chapter 228, Section 2; Laws of 1982, Chapter 230, Section 15)

Due Date

Collections from the severance tax on metalliferous minerals are due on the twentieth day of the month following the month in which the tax accrues. Taxes are delinquent if they are not received by the Department of Revenue on the day preceding the last day of the month in which they are due. The due date may be extended by the Department of Revenue for good cause, but not beyond the first day of the third month following the regular due date. (42-1465, 42-1322)

Collecting Agency

Department of Revenue. (42-1462, 42-101)

Dedication or Purpose

To aid in defraying the necessary and ordinary expenses of the state, cities, and counties to reduce or eliminate the annual tax levy on property for state, city and county purposes and to reduce the levy on property for public school education. (Laws of 1982, Chapter 230, Section 17)

Severance Tax on Metalliferous Minerals
Continued

Yield

No monies will be collected from this tax until fiscal year 1982-83.

Distribution

Each year, a portion of severance tax collections will be distributed in the same manner as the transaction privilege tax (i.e. 25 percent to the cities, 33.6 percent to the counties and 41.4 percent to the state). The portion of collections that is distributed in this manner will increase each fiscal year until 1986-87. The table below shows the amount of severance tax collections that will be distributed in the same manner as transaction privilege taxes during each fiscal year. (42-1465, Laws of 1982, Chapter 230, Section 16)

period during which collections are received	portion of severance tax collections distributed in the same manner as the transaction privilege tax
January 1, 1983 - June 30, 1983	40%
July 1, 1983 - June 30, 1984	48%
July 1, 1984 - June 30, 1985	60%
July 1, 1985 and thereafter	80%

After making this distribution the balance of severance tax collections will be deposited each year in the state's general fund and is appropriated for public educational purposes. (42-1465; Laws of 1982, Chapter 230, Section 16)

Source: State of Arizona Tax Handbook - 1983
Prepared by the Staff of the Joint Legislative Budget Committee

TABLE I

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1985

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
ANAMAX MINING COMPANY					
Eisenhower (Anamax share) 1/	None	None	None	None	None
Twin Buttes 2/	None				
Agitation Leach/SX/EW		1,471,664	19,728,834 (Cathodes)		
			95,924 (in $CuSO_4$)		
Total	None	1,471,664	19,823,758	None	None
ASARCO, INC.					
Mission Complex 1/	9,807,500	9,807,500	117,711,326	None	7,229,600
Silver Bell	None	None		None	None
Dump Leach/Cementation			8,800,000		
Total	9,807,500	9,807,500	126,511,326	None	7,229,600

1/ Mine was operated by Asarco but Anamax did not receive any of the ore.
2/ All production was from the oxide stockpile through the oxide plant.
3/ Prior to solvent extraction 74,460 pounds of yellow cake containing 65,927 pounds of U_3O_8 was extracted from the pulp.

1/ Mission complex is comprised of the Mission, San Xavier, Pima and Asarco's share of the Eisenhower sections.

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1985

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
CYPRUS MINERALS CO.					
Bagdad	19,912,000	18,958,000	161,690,000	4,933,000	8,993,000
Dump Leach/SX/EW			14,259,000		
Johnson					
Heap Leach/SX/EW 1/	None	None	6,200,000	None	None
Total	19,912,000	18,958,000	182,149,000	4,933,000	8,993,000
DUVAL CORPORATION					
Esperanza/Sierrita	40,800,000	37,300,000	215,500,000	19,500,000	22,200,000
Dump Leach/Cementation			10,000,000		
Mineral Park	None	None		None	None
Dump Leach/Cementation			3,798,000		
Total	40,800,000	37,300,000	229,298,000	19,500,000	22,200,000

1/ No ore was added to heaps but leaching continued.

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1985

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
INSPIRATION CONSOLIDATED					
Inspiration	16,627,000	8,158,000	68,944,000	283,000	24,927,000
Dump Leach/SX/EW			83,926,000		
Dump Leach/Cementation			1,210,000		
Total	16,627,000	8,158,000	154,080,000	283,000	24,927,000
KENNECOTT MINERAL CO.					
Ray Mines Division	12,612,521	9,404,673		None	28,631,850
Concentrates Sold			148,255,731		
Dump Leach/Cementation			18,587,671		
Heap Leach/Cementation			5,118,155		
Heap Leach/SX/EW			542,922		
Total	12,612,521	9,404,673	172,504,479	None	28,631,850

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1985

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
MAGMA COPPER CO.					
San Manuel - Sulphide	17,398,269	17,387,205	186,779,000	3,400,167	N/A
San Manuel - Oxide 1/	None	None	None	None	535,000
Total	17,398,269	17,387,205	186,779,000	3,400,167	535,000
NORANDA LAKESHORE MINES, INC.					
Lakeshore	None	None		None	None
In situ/SX/EW			13,514,125		
Total	None	None	13,514,125	None	None

1/ Production scheduled for 1986 from oxide open pit.

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1985

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
PHELPS DODGE CORP.					
Copper Queen Branch	None	None		None	None
Dump Leach/Cementation			4,144,137		
Morenci/Metcalf	36,918,928	36,918,928		569,240	25,129,842
Conc. Smelted			276,767,478		
Conc. Sold			185,297,353		
Dump Leach/Cementation			53,227,739		
New Cornelia Branch	None	None		None	None
Dump Leach/Cementation			402,061		
Total	36,918,928	36,918,928	519,838,768	569,240	25,129,842
PINTO VALLEY COPPER CORP.					
Pinto Valley	20,142,000	20,142,000	149,886,000	1,743,000	20,317,000
In situ/SX/EW			8,061,000		
Dump Leach/SX/EW			15,886,000		
Total	20,142,000	20,142,000	173,836,000	1,743,000	20,317,000
TOTAL LARGE COMPANIES	174,218,218	159,547,970	1,778,334,456	30,428,407	137,963,292

Source: Personal correspondence with individual companies.

TABLE II

ARIZONA LEACH COPPER PRODUCTION 1/

(Thousand Pounds)

MINE OPERATION	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
ANAMAX MINING COMPANY										
Twin Buttes	57,925	68,772	71,614	70,343	63,719	67,922	60,796	50,649	50,239	19,824
ASARCO INCORPORATED										
San Xavier	22,772	12,860	15,183	--	--	--	--	--	--	--
Silver Bell	8,627	5,012	6,267	6,980	4,423	7,950	8,687	10,374	9,152	8,800
CYPRUS MINES CORP.										
Bagdad	14,606	15,011	14,097	14,337	12,668	13,244	13,173	13,282	14	14,259
Johnson	10,060	10,327	10,205	10,032	10,302	10,693	9,702	--	8,803	6,200
DUVAL CORPORATION										
Esperanza	6,412	8,636	7,469	6,002	9,991	11,566	9,354	6,367	8,500	10,000
Mineral Park	6,817	5,260	4,813	3,348	3,690	4,194	3,191	3,101	2,718	3,798
INSPIRATION CONSOLIDATED COPPER COMPANY										
Inspriation	45,545	20,883	35,945	16,638	28,958	50,532	50,000	78,988	79,549	85,136
Ox Hide	7,915	4,639	4,147	1,178	1,015	761	1,572	--	--	--
KENNECOTT CORPORATION										
Ray	24,374	24,334	25,013	26,502	25,875	25,788	22,420	20,033	20,457	23,706
NORANDA LAKESHORE MINES										
Lakeshore	28,407	25,031	--	--	--	26,071	45,611	3,244	15,401	13,514
PHELPS DODGE CORPORATION										
Copper Queen Branch 2/	7,893	8,526	7,932	7,316	6,052	4,600	4,545	5,200	3,493	4,144
Morenci Branch	53,136	41,545	51,362	93,983	86,840	96,090	75,735	69,158	60,312	53,228
New Cornelia Branch	--	--	--	--	--	--	661	--	920	402
PINTO VALLEY COPPER CORP.										
Copper Cities	3,370	3,346	3,806	4,351	3,984	3,622	2,046	--	--	--
Miami 3/	13,509	11,732	11,703	12,636	11,184	10,217	10,301	9,289	25,602	23,947
Pinto Valley	--	--	--	--	--	5,519	16,657	15,343	--	--

TABLE II (CONT)

ARIZONA LEACH COPPER PRODUCTION 1/

(Thousand Pounds)

MINE OPERATION	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION (Now HECLA MINING CO.)										
Bluebird	17,876	17,069	3,926	10,955	13,017	13,328	NR	--	--	--
Old Reliable	--	--	--	1,005	1,128	149	--	--	--	--
TOTALS	329,244	282,983	283,482	285,606	282,846	352,246	334,451	285,028	285,160	266,958
PERCENT OF PRIMARY COPPER PRODUCED 4/ 5/	16.1	15.3	13.9	13.3	16.4	15.0	19.6	18.8	18.0	15.0

Source: Arizona Department of Mines and Mineral Resources; This report, Table I-II

1/ Copper recovered from precipitate and/or by solvent extraction from material dump, heap, vat or in-situ leached.
2/ Lavender Pit and Copper Queen Mine.
3/ Combined Miami and Pinto Valley production from 1984.
4/ Leach copper compared to total copper produced from all primary sources as reported in "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines for 1975-1978.
5/ Leach Copper compared to total copper produced as reported in Table I for 1979-1985.

TABLE III

RANK OF ARIZONA'S COPPER COMPANIES

BY PRODUCTION OF COPPER AND MOLYBDENUM

1985

Copper 1/			Molybdenum		
Rank	Company	% of AZ Production	Rank	Company	% of AZ Production
1	Phelps Dodge Corp.	29.23	1	Duval Corp.	64.09
2	Duval Corp.	12.90	2	Cyprus Mines Corp.	16.21
3	Magma Copper Co.	10.50	3	Magma Copper Co.	11.17
4	Cyprus Mines Corp.	10.24	4	Pinto Valley Copper Corp.	5.73
5	Pinto Valley Copper Corp.	9.78	5	Phelps Dodge Corp.	1.87
6	Kennecott Corp.	9.70	6	Inspiration Cons. Copper Corp.	0.93
7	Inspiration Cons. Copper Corp.	8.67			
8	ASARCO Inc.	7.11			
9	Anamax Mining Co.	1.11			
10	Noranda Lakeshore Mines Inc.	0.76			
		100.00			100.00

Source: Arizona Department of Mines and Mineral Resources: This Report, Table I

1/ Precipitate and/or cathode copper included in production total where applicable.

TABLE IV
RANK OF ARIZONA'S COPPER MINES
BY PRODUCTION OF COPPER AND MOLYBDENUM 1985

	COPPER 1/		MOLYBDENUM	
Rank	Mine/Company Copper Produced, lb.	% of AZ Production	Mine/Company Moly. Produced, lb.	% of AZ Production
1	Morenci-Metcalf/Phelps Dodge 515,292,570	28.97	Sierrita-Esperanza/Duval 19,500,000	64.09
2	Sierrita-Esperanza/Duval 225,500,000	12.68	Bagdad/Cyprus 4,933,000	16.21
3	San Manuel/Magma 186,779,000	10.50	San Manuel/Magma 3,400,167	11.17
4	Bagdad/Cyprus 175,949,000	9.89	Pinto Valley/Pinto Valley 1,743,000	5.73
5	Pinto Valley/Pinto Valley 173,836,000	9.78	Morenci-Metcalf/Phelps Dodge 569,240	1.87
6	Ray/Kennecott 172,504,479	9.70	Inspiration/Inspiration 283,000	0.93
7	Inspiration/Inspiration 154,080,000	8.67		
8	Mission Complex/ASARCO 117,711,326	6.62		
TOTAL	1,721,652,375	96.81%	30,428,407	100.00%

Source: Arizona Department of Mines and Mineral Resources: This Report, Table I

1/ Precipitate and/or cathode copper included in production total where applicable.

TABLE V
ARIZONA MINE PRODUCTION
OF RECOVERABLE COPPER IN SHORT TONS

	1981		1982		1983		1984		1985	
	AMOUNT	CHANGE	AMOUNT	CHANGE	AMOUNT	CHANGE	AMOUNT	CHANGE	AMOUNT	CHANGE
					BY MONTH					
JANUARY	92,769	(0.6)%	84,559	(8.7)%	68,560	(19.0)%	68,096	0.4%	72,508	6.5%
FEBRUARY	88,061	2.0	82,181	(6.7)	54,455	(30.1)	62,432	9.8	67,823	8.6
MARCH	94,366	(2.3)	90,488	(4.1)	66,475	(26.5)	66,058	0.4	76,717	16.1
APRIL	95,002	1.8	87,385	(8.0)	61,841	(29.2)	61,076	(0.2)	75,928	24.3
MAY	97,306	1.6	73,434	(24.5)	63,699	(13.3)	66,125	4.9	76,690	16.0
JUNE	93,704	10.0	67,208	(28.3)	65,449	(2.6)	71,133	9.8	70,816	(0.4)
JULY	95,125	162.6	60,795	(36.1)	54,653	(10.1)	70,235	29.9	72,534	3.3
AUGUST	101,909	304.2	56,753	(44.3)	52,118	(8.2)	70,019	35.8	74,134	5.9
SEPTEMBER	98,489	290.3	55,942	(43.2)	64,852	15.9	69,528	8.3	70,732	1.7
OCTOBER	103,774	109.3	61,588	(40.7)	64,049	4.0	73,316	15.8	74,081	1.0
NOVEMBER	102,832	35.8	68,010	(33.9)	69,886	2.8	73,541	6.3	73,129	(0.6)
DECEMBER	83,962	(2.8)	60,307	(28.2)	65,366	8.4	68,901	4.8	78,987	14.6
					CUMULATIVE YEAR TO DATE					
JANUARY	92,769	(0.6)%	84,659	(8.7)%	68,560	(19.0)%	68,096	0.4%	72,508	6.5%
FEBRUARY	180,830	0.6	166,840	(7.7)	126,015	(24.5)	130,528	4.7	140,331	7.5
MARCH	275,196	(0.4)	257,328	(6.5)	192,490	(25.2)	196,586	3.2	217,048	10.4
APRIL	370,198	0.2	344,713	(6.9)	254,331	(26.2)	257,662	2.4	292,976	13.7
MAY	467,504	0.5	418,147	(10.6)	318,030	(23.9)	323,787	2.9	369,666	14.2
JUNE	561,208	1.9	485,355	(13.5)	383,479	(21.0)	394,920	4.1	440,482	11.5
JULY	656,333	11.9	546,150	(16.8)	438,132	(19.8)	465,155	7.3	513,016	10.3
AUGUST	758,242	23.9	602,903	(20.5)	490,250	(18.7)	535,174	10.3	587,150	9.7
SEPTEMBER	856,731	34.4	658,845	(23.1)	555,102	(15.7)	604,702	10.1	657,882	8.8
OCTOBER	960,505	39.9	720,433	(25.0)	619,151	(14.1)	678,018	10.7	731,963	8.0
NOVEMBER	1,063,337	39.4	788,443	(25.9)	689,037	(12.6)	751,559	10.2	805,092	7.1
DECEMBER	1,147,299	35.1	848,750	(26.0)	754,403	(11.1)	820,460	9.7	884,079	7.7
AVERAGE MONTH	95,608	35.2%	70,729	(26.0)%	62,867	(11.1)%	68,372	9.7%	73,673	7.7%

NOTE: Percentage change column shows change from corresponding period in prior year. Parentheses indicate a negative change.

Source: U.S. Department of the Interior, Bureau of Mines
Prepared By: State of Arizona Joint Legislative Budget Committee.

TABLE VI

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

(Percent Total Copper)

MINE OPERATION		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
ANAMAX MINING COMPANY 1/											
Twin Buttes	Sulfide	1.12	1.11	1.26	0.94	0.82	0.74	0.78	0.67	--	--
	Oxide	1.31	1.30	1.26	1.27	1.26	1.20	1.06	0.93	0.86	0.84
ASARCO INCORPORATED											
Mission 2/	Sulfide	0.62	0.58	0.59	0.60	0.75	0.75	(0.75)	(0.75)	(0.75)	0.65
Sacaton	Sulfide	0.71	0.70	0.67	0.68	--	--	--	--	--	--
San Xavier 2/	Sulfide	--	--	--	0.80	0.65	0.65	(0.65)	(0.51)	(0.51)	--
	Oxide	1.12	--	--	--	--	--	--	--	--	--
Silver Bell	Sulfide	0.72	0.65	0.65	--	--	--	--	--	--	--
CYPRUS MINES CORPORATION											
Bagdad	Sulfide	0.60	0.59	0.52	0.50	0.50	0.50	0.50	0.50	0.45	0.44
	Oxide	--	--	--	--	--	--	--	--	0.22	0.28
Johnson	Oxide 3/	0.42	0.46	0.44	0.40	0.40	0.40	0.40	0.40	0.71	--
Pima 2/	Sulfide	0.47	0.48	--	0.46	0.49	0.49	0.48	--	--	--
DUVAL CORPORATION											
Esperaa	Sulfide	0.29	0.29	--	--	0.32	0.29	0.29	--	--	--
Mineral Park	Sulfide	0.28	0.28	0.26	0.24	0.24	0.32	--	--	--	--
Sierrita	Sulfide	0.35	0.34	0.33	0.34	0.34	0.30	0.30	(0.30)	0.34	0.33
INSPIRATION CONSOLIDATED COPPER CO.											
Christmas (OP)	Sulfide	0.58	0.74	--	0.74	0.73	0.62	0.62	--	--	--
Inspiration Area	Sulfide	0.63	0.70	0.61	0.85	0.58	0.58	0.58	0.53	0.55	0.60
	Oxide	--	--	--	--	--	--	--	--	0.50	0.49
Ox Hide	Oxide 3/	0.27	0.27	--	--	--	--	--	--	--	--
KENNECOTT CORPORATION											
Ray 4/	Sulfide	0.86	0.92	0.86	0.88	0.91	0.97	0.80	1.19	1.13	0.99
	Oxide (Silicate)	1.15	--	--	--	--	--	--	--	--	1.17

(continued)

TABLE VI (CONT)

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

(Percent Total Copper)

MINE OPERATION		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
MAGMA COPPER COMPANY											
San Manuel	Sulfide	(0.70)	(0.70)	0.64	0.63	0.65	0.64	0.66	0.64	0.64	0.61
Superior	Sulfide	(4.50)	(4.50)	4.36	4.41	4.32	4.48	4.32	--	--	--
NORANDA LAKESHORE MINES INC.											
Lakeshore 5/	Sulfide	0.75	0.91	--	--	--	--	--	--	--	--
	Oxide 3/	1.03	0.93	--	--	--	1.00	1.00	(1.00)	(1.00)	--
PHELPS DODGE CORPORATION											
Metcalf	Sulfide	0.86	0.70	0.79	0.78	0.69	--	0.78	--	--	--
Morenci 6/	Sulfide	0.80	0.81	0.80	0.71	0.82	0.74	0.72	0.73	0.81	0.86
New Cornelia	Sulfide	0.66	0.64	0.59	0.53	0.51	0.50	0.64	0.60	0.55	--
PINTO VALLEY COPPER CORP.											
Pinto Valley	Sulfide	(0.45)	0.49	0.52	0.49	0.49	0.46	0.46	--	0.44	0.45
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION (Now Hecla Mining Co.)											
Bluebird 7/	Oxide	0.58	0.79	0.70	0.40	0.40	0.40	--	--	--	--
WEIGHTED AVERAGE SULFIDE GRADE 8/		0.61	0.57	0.61	0.64	0.58	0.58	0.59	0.65	0.70	0.62

(continued)

TABLE VI (CONT)

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

Source: Company annual reports, Form 10-K's and Prospectus; Personal correspondence and Arizona Department of Mines and Mineral Resources.

( ) Percentage in parenthesis is approximate: not used in calculation of weighted average.

1/ Included ANAMAX share of Palo Verde deposit for 1979-1982.

2/ Combined as Mission Complex in 1985.

3/ Acid soluble copper.

4/ Grade reported for Kennecott's Ray mine is an average of oxide and sulfide together for 1977 to 1982.

5/ The Lakeshore mine was owned and operated by the Hecla Mining Company in 1976 and 1977.

6/ Combined Metcalf and Morenci mines production in 1983 - 1985.

7/ Bluebird property acquired by Inspiration in 1984.

8/ Weighted average grade of ore milled, based generally on an assay of total copper.

TABLE VII

PERCENT CONTAINED COPPER RECOVERED AT ARIZONA COPPER MINES 1/

(Percent of Total Copper)

MINE OPERATION		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
ANAMAX MINING COMPANY											
Twin Buttes 2/	Sulfide	68	87	76	85	87	85			--	--
	Oxide	75	76	79	78	76	77	Total 87	(80 est.)	80	(80 est.)
ASARCO INCORPORATED											
Mission 3/	Sulfide	89	87	87	75	87	94	85	80	(80 est.)	92
Sacaton	Sulfide	82	82	83	78	--	--	--	--	--	--
San Xavier 3/	Sulfide	--	--	--	82	66	76	78	79	(80 est.)	--
	Oxide	77	--	--	--	--	--	--	--	--	--
Silver Bell	Sulfide	81	78	78	--	--	--	--	--	--	--
CYPRUS MINES CORPORATION											
Bagdad	Sulfide	86	73	83	82	76	94	83	83	92	91
	Oxide	--	--	--	--	--	--	--	--	52	51
Johnson	Oxide 4/	91	90	96	79	86	86	--	62	(62 est.)	--
Pima 3/	Sulfide	84	79	--	76	84	76	89	--	--	--
DUVAL CORPORATION											
Esperanza	Sulfide	91	85	--	--	90	87	--	--	--	--
Mineral Park	Sulfide	73	75	76	73	84	75	--	--	--	--
Sierrita	Sulfide	88	88	91	87	86	80	98 (?)	(88 est.)	89	92
INSPIRATION CONSOLIDATED COPPER CO.											
Christmas (OP)	Sulfide	77	74	--	--	70	71	--	--	--	--
Inspiration Area 5/	Sulfide	45	54	55	53	81	74	68	86	80	76
Ox Hide	Oxide 4/	67	56	--	--	--	--	--	--	--	--
KENNECOTT CORPORATION											
Ray	Sulfide	--	--	--	--	--	70	70	(70 est.)	83	81

(continued)

TABLE VII (CONT)

PERCENT CONTAINED COPPER RECOVERED AT ARIZONA COPPER MINES 1/

(Percent of Total Copper)

MINE OPERATION		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
MAGMA COPPER COMPANY											
San Manuel	Sulfide	--	--	85	83	95	87	89	86	90	90
Superior	Sulfide	--	--	90	91	95	93	(93 est.)	--	--	--
NORANDA LAKESHORE MINES INC.											
Lakeshore	Sulfide	100	99	--	--	--	--	--	--	--	--
	Oxide 4/	98	100	--	--	--	92	--	--	--	--
PHELPS DODGE CORP.											
Metcalf	Sulfide	54	56	61	59	58	--	--	--	--	--
Morenci 6/	Sulfide	70	72	77	68	64	69	68	71	70	86
New Cornelia	Sulfide	80	82	84	80	79	78	85	78	76	--
PINTO VALLEY COPPER CORP.											
Pinto Valley	Sulfide	--	92	89	84	83	94	95	--	88	80
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION (Now Hecla Mining Co.)											
Bluebird 7/ 8/	Oxide	36	38	85	36	41	156	--	--	--	--

(continued)

TABLE VII (CONT)

PERCENT CONTAINED COPPER RECOVERED AT ARIZONA COPPER MINES

Source: Company Annual Reports and Form 10-K's, E&MJ International Directory; Arizona Department of Mines and Mineral Resources.

1/ Recoveries are based on available reported production and average grade of material treated. A number of oxide operations are not listed because of inadequate data.

2/ Recovery includes ANAMAX's share of Palo Verde 1979-1981-1982-1983-1984.

3/ Combined as Mission Complex in 1985.

4/ Percent recovery of acid soluble copper.

5/ Percent recovery in flotation-concentration treatment, after ore has been leached for 1971-1979.

6/ Includes Metcalf production, 1983-1985.

7/ Bluebird property acquired by Inspiration in 1984.

8/ Recovery by leaching heaps continued after mining was terminated in July 1981.

TABLE VIII

STRIPPING RATIOS AT ARIZONA OPEN-PIT COPPER MINES 1/

(Waste:Ore)

MINE OPERATION	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
ANAMAX MINING COMPANY										
Twin Buttes	5.50:1	5.60:1	2.00:1	2.90:1	3.32:1	3.62:1	2.05:1	1.14:1	--	--
ASARCO INCORPORATED										
Eisenhower 2/ 3/	--	--	--	--	--	0.71:1	0.67:1	0.57:1	1.26:1	--
Mission 3/	1.50:1	2.30:1	2.30:1	0.76:1	3.05:1	2.01:1	1.62:1	2.52:1	1.32:1	0.74:1
Sacaton	5.90:1	4.40:1	2.70:1	3.10:1	2.02:1	1.30:1	0.70:1	0.35:1	0.10:1	--
San Xavier 3/	5.10:1	5.00:1	1.10:1	1.10:1	6.01:1	6.18:1	2.90:1	0.96:1	1.97:1	--
Silver Bell	1.60:1	1.80:1	1.40:1	1.50:1	--	1.41:1	--	1.09:1	1.17:1	--
CYPRUS MINES CORPORATION										
Bagdad	9.80:1	7.80:1	1.70:1	1.80:1	1.52:1	1.78:1	1.45:1	1.53:1	0.94:1	0.42:1
Johnson	1.50:1	1.60:1	2.50:1	1.30:1	2.01:1	1.52:1	--	0.03:1	--	--
Pima 3/	2.00:1	1.60:1	--	5.20:1	6.28:1	3.06:1	1.42:1	--	--	--
DUVAL CORPORATION										
Esperanza	1.10:1	1.10:1	--	1.30:1	0.76:1	1.95:1	--	--	--	--
Mineral Park	2.10:1	1.60:1	1.50:1	1.70:1	1.71:1	1.44:1	--	--	--	--
Sierrita	1.50:1	1.60:1	1.30:1	1.10:1	1.11:1	0.98:1	0.55:1	0.33:1	0.76:1	0.55:1
INSPIRATION CONSOLIDATED COPPER COMPANY										
Christmas	3.10:1	4.40:1	--	--	4.40:1	3.24:1	--	--	--	--
Inspiration Area	1.90:1	2.40:1	2.80:1	3.40:1	2.40:1	1.53:1	1.42:1	0.27:1	1.72:1	1.50:1
Ox Hide	0.38:1	0.20:1	--	--	--	--	--	--	--	--
KENNECOTT CORPORATION										
Ray	2.60:1	2.50:1	3.10:1	2.70:1	3.15:1	1.88:1	2.30:1	2.72:1	2.11:1	2.27:1
PHELPS DODGE CORPORATION										
Metcalf	1.80:1	1.80:1	1.50:1	2.30:1	1.67:1	--	--	--	--	--
Morenci 4/	1.30:1	1.50:1	1.50:1	1.40:1	1.30:1	1.63:1	0.79:1	0.64:1	0.90:1	0.68:1
New Cornelia 5/	1.10:1	1.10:1	1.40:1	1.00:1	2.27:1	0.48:1	1.21:1	0.30:1	0.58:1	--

(continued)

TABLE VIII (CONT)

STRIPPING RATIOS AT ARIZONA OPEN-PIT COPPER MINES 1/

(Waste:Ore)

MINE OPERATION	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
PINTO VALLEY COPPER CORP.										
Pinto Valley	1.70:1	1.70:1	1.60:1	1.80:1	1.07:1	1.77:1	1.80:1	--	0.79:1	1.01:1
RANCHERS EXPLORATION & DEVELOPMENT CORP. (Now Hecla Mining Co.)										
Bluebird 6/ 7/	1.80:1	3.30:1	1.50:1	1.50:1	1.50:1	0.003:1	--	--	--	--
WEIGHTED AVERAGE*	1.79:1	2.21:1	1.75:1	1.75:1	1.90:1	1.57:1	1.31:1	0.57:1	1.10:1	0.88:1

Source: "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines; Company Annual Reports; E&MJ International Directory of Mining and Mineral Processing Operations; Arizona Department of Mines & Mineral Resources; Company submitted data for 1985.

1/ Leachable rock included with waste (except at solely leach opertions).
2/ Mining is done by ASARCO, includes ANAMAX's share of ore.
3/ Combined as Mission Complex 1985.
4/ Combined Morenci and Metcalf 1984-1985.
5/ Includes preproduction stripping 1980-1981.
6/ Stripping of overburden ceased in January 1981, but mining continued until July.
7/ Bluebird Property acquired by Inspiration in 1984.

*NOTE: These are now weighted averages so use caution in making comparisons to the averages presented in previous editions of this report.

TABLE IX

ARIZONA PRODUCTION AND VALUE OF COPPER, MOLYBDENUM, GOLD AND SILVER

RECOVERED FROM COPPER ORE

Year	Copper Ore 1/ Tons	Gold 2/ Troy Ounces Value 5/	Silver 2/ Troy Ounces Value 6/	Molybdenum 3/ 1,000 lbs. Value (in $1,000)	Copper 4/ Pounds Value	Copper 4/ Lbs. Cu/ton ore Ave.¢/lb. 7/	Value of Copper Gold, Silver & Molybdenum
1970	150,240,842	107,292 $ 3,904,400	7,130,261 $12,626,700	15,672 $ 26,700	1,694,294,000 $ 977,608,000	11.28 57.700	$1,020,839,100
1971	149,293,547	93,617 $ 3,820,510	6,106,204 $ 9,437,479	22,684 $ 39,872	1,529,780,500 $ 786,812,004	10.25 51.433	$ 839,942,263
1972	165,914,825	102,526 $ 5,987,518	6,614,957 $11,143,226	27,126 $ 46,791	1,695,858,000 $ 858,392,446	10.22 50.617	$ 922,314,190
1973	181,311,945	102,376 $10,013,397	7,164,988 $18,325,173	37,657 $ 59,372	1,735,012,000 $1,021,314,814	9.57 58.865	$1,109,025,384
1974	178,913,296	90,206 $14,488,424	6,308,721 $29,701,332	28,346 $ 57,067	1,609,808,000 $1,233,901,735	9.00 76.649	$1,335,158,491
1975	168,750,152	82,759 $13,364,751	6,190,805 $27,354,196	25,030 $ 61,411	1,502,978,000 $ 954,917,072	8.91 63.535	$1,057,047,019
1976	194,136,559	97,961 $12,276,473	7,308,395 $31,816,805	31,073 $ 89,148	1,912,430,000 $1,316,210,823	9.85 68.824	$1,449,452,101
1977	168,641,401	87,874 $13,032,593	6,696,415 $30,957,660	34,574 $120,497	1,705,240,000 $1,122,184,339	10.11 65.808	$1,166,295,089
1978	178,204,491	92,508 $17,905,108	6,611,781 $35,709,502	33,029 $150,142	1,817,670,000 $1,190,755,617	10.20 65.510	$1,244,520,369
1979	203,977,408	99,549 $30,622,766	7,454,306 $82,699,941	35,101 $213,065	1,914,501,095 $1,767,735,441	9.39 92.334	$2,094,081,895

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TABLE IX CONTINUED

ARIZONA PRODUCTION AND VALUE OF COPPER, MOLYBDENUM, GOLD AND SILVER

RECOVERED FROM COPPER ORE

Year	Copper Ore 1/ Tons	Gold 2/ Troy Ounces Value 5/	Silver 2/ Troy Ounces Value 6/	Molybdenum 3/ 1,000 lbs. Value (in $1,000)	Copper 4/ Pounds Value	Copper 4/ Lbs. Cu/ton ore Ave.¢/lb. 7/	Value of Copper Gold, Silver & Molybdenum
1980	169,650,401	71,533 $43,814,606	5,640,703 $116,376,559	36,299 $324,150	1,521,850,812 $1,543,400,219	8.97 101.416	$2,027,741,384
1981	216,787,430	95,496 $43,891,299	7,565,368 $ 79,575,340	35,600 $273,052	2,143,898,000 $1,795,385,941	9.89 83.744	$2,191,904,580
1982	146,124,870	61,050 $22,949,000	6,301,000 $ 50,090,000	22,099 $100,673	1,697,500,000 $1,261,415,000	11.62 74.31	$1,435,127,000
1983	152,902,150	61,991 $26,284,000	4,492,000 $ 51,383,000	23,934 $ 79,459	1,495,208,000 $1,144,285,000	9.78 76.53	$1,301,411,000
1984	145,278,431	51,548 $18,591,200	4,068,000 $ 33,557,000	23,184 $ 78,827	1,582,549,000 $1,044,483,000	10.89 66.00	$1,175,458,200
1985	159,547,970	52,053 $16,585,000	3,926,000 $ 24,338,000	30,428 $ 98,827	1,778,334,456 $1,166,571,000	11.14 65.60	$1,306,321,000

Source: "Mineral Yearbook - Area Reports: Domestic", U.S. Bureau of Mines.

1/ Includes some copper-zinc, copper-lead, and/or lead-zinc ore in 1972 and thereafter.
2/ Excludes gold and silver recovered from vat or heap leaching of copper ores and from copper tailings or copper cleanup in 1969 and thereafter.
3/ Molybdenum content of recovered concentrate.
4/ Excludes precipitate copper from dump and in-place leaching prior to 1982.
5/ At average annual domestic, free market gold price in 1970 and thereafter: 1970, $36.39; 1971, $40.81; 1972, $58.40; 1973, $97.81; 1974, $159.73; 1975, $161.49; 1976, $125.32; 1977, $148.31; 1978, $193.55; 1979, $307.615; 1980, $612.509; 1981, $459.614; 1982, $375.905; 1983, $423.997; 1984, $360.658; 1985, $317.659.
6/ At E&MJ average annual N.Y. market price for .999 fine silver.
7/ At E&MJ average annual price, domestic FOB refinery.
P/ Preliminary.

TABLE X

NONFUEL MINERAL PRODUCTION IN ARIZONA 1/

Mineral	1984 Quantity	1984 Value (thousands)	1985 P/ Quantity	1985 P/ Value (thousands)
Clays ----------thousand short tons--	138	$819	182	$1,228
Copper (recoverable content of ores, etc.) ----metric tons--	746,453	1,100,182	768,351	1,133,233
Gem stones ----------	NA	2,700	NA	2,700
Gold (recoverable content of ores, etc.) ------troy ounces--	51,548	18,591	W	W
Gypsum ----------thousand short tons--	261	2,332	264	2,191
Lime ----------do--------	359	17,304	481	22,977
Molybdenum (content of concentrate) -------thousand pounds--	24,013	76,112	24,261	76,423
Pumice ----------thousand short tons--	2	21	2	22
Sand and gravel:				
Construction ----------do--------	30,439	101,959	38,000	122,900
Silver (recoverable content of ores, etc.) thousand troy ounces--	4,093	33,320	3,926	24,338
Stone:				
Crushed ----------thousand short tons--	e/5,200	e/27,300	5,800	29,800
Dimension ----------do--------	e/(2/)	e/(2/)	(2/)	1
Combined value of cement, lead, perlite, pyrites, salt, sands and gravel (industrial), tin, and value indicated by symbol W ----------	XX	102,839	XX	116,761
Total ----------	XX	1,483,479	XX	1,532,574

Source: "The Mineral Industry of Arizona in 1985" Mineral Industry Surveys, U.S. Bureau of Mines.

e/ Estimated.
P/ Preliminary.
NA Not applicable
W Withheld to avoid disclosing company proprietary data; value included in "Combined value" figure.
XX Not applicable.
1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers)
2/ Less than 1/2 unit.

TABLE XI

COPPER MINE CAPACITY IN ARIZONA 1/
(Short tons of Recoverable Copper/Year)

OPERATOR	MINE	CAPACITY
Phelps Dodge	Morenci/Metcalf	258,000
Anamax	Twin Buttes	135,000 2/
Magma	San Manuel	126,000
Kennecott	Ray	122,000
Duval	Sierrita	102,000
Pinto Valley Copper	Pinto Valley	85,000
Cyprus	Bagdad	85,000
Inspiration	Inspiration Area	77,000
ASARCO 3/	Mission Complex	59,000
Phelps Dodge	New Cornelia	40,000
Duval	Esperanza	22,500
Duval	Mineral Park	17,000
Noranda	Lakeshore	16,000
Inspiration	Christmas	8,500
Pinto Valley Copper	Miami	6,000
Pinto Valley Copper	Copper Cities	2,000
Phelps Dodge	Copper Queen/Lavender	1,700
TOTAL		1,162,700

Source: Arizona Department of Mines & Mineral Resources file data; Company Annual Reports and Form 10-K; Professional Publications

1/ Figures generally represent a current estimate of the productive capacity of primary recoverable copper in concentrates, precipitates, and cathodes. Figures do not represent smelter or refinery capacity. The estimates are based on recent production figures and on capacities of concentrator and leach plant facilities. Other factors affecting actual production include, for example, grade of ore and recovery. Some capacities have been published by the reporting company.

2/ Includes approximately 33,000 tons of copper concentrated annually from ore obtained at the Eisenhower mine.

3/ The Mission mill treats ore from the Mission, San Xavier and ASARCO's share of Eisenhower mine production.

TABLE XII

MINE PRODUCTION OF COPPER IN THE UNITED STATES

Short Tons

	1981	1982	1983	1984	1985
ARIZONA	1,147,299	848,251	747,604	824,486	882,424
IDAHO	4,679	3,389	3,920	4,113	3,996
MISSOURI	9,272	8,753	8,515	(b)	(b)
MONTANA	68,878	71,596	36,748	19,502	16,674
NEW MEXICO	169,881	(b)	(b)	(b)	(b)
UTAH	232,892	208,436	187,118	(b)	(b)
OTHER STATES (a)	62,628	123,897	160,401	350,085	300,775
TOTAL	1,695,529	1,264,322	1,144,306	1,198,186	1,203,869

Source: American Bureau of Metal Statistics, Inc. Non-Ferrous Metal Data 1985, p. 25.
Derived from U.S. Bureau of Mines data.

(a) Includes California, Colorado, Maine, Michigan, Nevada, Oregon, Tennessee and Washington.
(b) Included in "Other States".

TABLE XIII

COPPER SMELTERS

End of 1985-Short Tons

Company	Location Of Plant	Annual Capacity
	UNITED STATES	
ASARCO Incorporated	Hayden, Ariz.	940,000
	El Paso, Texas	576,000
	Tacoma, Wash.	(c)
Chemetco Inc.	Alton, Illinois	150,000
Copper Range Company		
White Pine Copper Division	White Pine, Mich.	70,000
Inspiration Consolidated		
Copper Company	Claypool, Ariz.	450,000
Kennecott		
Chino Mines Company	Hurley, N.M.	500,000
Nevada Mines Division	Mcgill, Nev.	255,000
Ray Mines Division	Hayden, Ariz.	360,000
Utah Copper Division	Garfield, Utah	820,000
Magma Copper Company		
San Manuel Division	San Manuel, Ariz.	800,000
Phelps Dodge Corporation		
Douglas Smelter	Douglas, Ariz.	500,000
Morenci Branch	Morenci, Ariz.	650,000
New Cornelia Branch	Ajo, Ariz.	190,000
Tyrone Branch	Playas, N.M.	750,000
Tennessee Chemical Company	Copperhill, Tenn.	18,000
United States Metals Refining Co., A Division of AMAX Copper, Inc.	Carteret, N.J.	250,000
Total (a)		7,279,000
	CANADA	
Falconbridge Ltd.	Falconbridge, Ont.	700,000
Gaspe Mines	Murdochville, Que.	357,000
Hudson Bay Mining and Smelting Co., Ltd.	Flin Flon, Manitoba	350,000
Inco Ltd.	Copper Cliff, Ont.	2,400,000
Noranda Mines, Ltd.	Noranda, Que.	1,000,000
Total (a)		4,807,000

-continued-

COPPER SMELTERS continued

MEXICO

Cia. Minera De Santa Rosalia, S.A.	Santa Rosalia, Baja, Calif.	100,000
Compania Minera De Cananea, S.A.	Cananea, Son.	277,000
Industrial Minera Mexico, S.A.	San Luis Potosi	300,000
Total (a)		677,000

Source: American Bureau of Metal Statistics Inc. Non-Ferrous Metal Data, 1985, p.29

The capacity of copper smelting works is given as estimated by the respective proprietors.

(a) Tons of material.
(b) Tons of product.
(c) Smelting operations ceased early 1985.

TABLE XIV

COPPER PRODUCTION BY COMPANIES (g)

Short Tons

	1981	1982	1983	1984	1985
United States					
Anaconda Copper Company (own mines) (d)	149,257	164,291	43,243	14,933	--
Anamax Mining Company	135,175	145,290	49,108	25,709	9,864
ASARCO Incorporated	112,694	119,615	110,746	103,710	85,470
Cominco American Incorporated And Dresser Minerals (e)	2,058	2,033	869	1,045	1,192
Copper Range Company (f)	43,362	22,600	26,575	24,761	--
Cyprus Bagdad Copper Company	71,507	86,623	81,033	23,876	83,671
Cyprus Johnson Copper Company	5,347	4,851	4,859	4,401	3,100
Cyprus Pima Mining Company	40,632	20,201	--	--	--
Duval Corporation	130,555	58,027	71,510	92,204	110,690
Hecla Mining Company (a)	1,566	1,159	1,283	742	749
Coeur Mine (j)	59	60	56	61	61
Consolidated Silver (m)	43	2	--	--	--
Galena Mine (k)	316	330	307	172	154
Lucky Friday Mine	374	666	756	442	534
Sunshine Mine	235	101	164	67	--
Victoria Mine	539	--	--	--	--
Inspiration Consolidated Copper Company (f)	64,700	54,699	40,778	44,112	40,402
Kennecott (U.S. mines) (l)	372,213	285,716	318,000	303,000	235,000
Magma Copper Company (f)	165,560	132,374	99,705	120,345	108,642
Superior Division	42,462	25,633	--	--	--
San Manuel Division	123,098	106,741	99,705	120,345	108,642
Noranda Lakeshore Mines, Inc. (b)	13,035	22,800	18,760	7,701	6,779
Phelps Dodge Corporation (U.S. mines) (b)	315,700	150,100	263,100	331,232	410,076
Pinto Valley Copper Corporation	92,311	56,848	10,264	56,507	90,839
Ranchers-Exploration And Development Corp. (n)	6,663	3,998	--	--	--
Tennessee Chemical Company	12,619	11,685	11,725	9,245	8,450
Refiners (c)	529,087	465,987	401,567	451,603	442,705
AMAX Copper, Inc.	169,275	147,509	126,799	105,226	28,508
ASARCO Incorporated	359,812	318,478	274,768	346,377	414,197

(a) Includes Hecla's share of production from each mining property.
(b) Includes copper produced from purchased ores.
(c) The totals for these concerns are to a large extent duplications of the reports of other producers.
(d) Includes Anaconda's 50% share of Anamax Mining Company.
(e) Magmont mine.
(f) Refined production.

TABLE XIV continued

(g) Copper content of mine production unless otherwise noted.
(h) Mine abandoned in 1979.
(i) Mine abandoned in 1981.
(j) Operated by ASARCO - Shows Hecla Mines share of 5%.
(k) Operated by ASARCO - Shows Hecla Mines share of 25%.
(l) Reported production of refined copper plus unrefined copper sales. Includes only Kennecott's share from jointly owned properties.
(m) Operated by Hecla Mining Company - Shows Hecla's 64% share.
(n) Ranchers was merged into Hecla Mining Company in 1984. Production at the Bluebird was discontinued in 1982 and the property has been sold.

Source: Non-Ferrous Metal Data pp. 22, American Bureau of Metal Statistics, Inc.

TABLE XV

Copper Imports Of The United States By Countries

Copper Content-Short Tons

	1981	1982	1983	1984	1985
Ore, Matte & Regulus	**36,036**	**108,133**	**102,807**	**17,075**	**7,710**
Canada	2,393	22,850	41,304	4,084	2,820
Mexico	12,412	57,814	34,350	249	19
Honduras	--	--	2,260	254	83
Bolivia	--	14	26	--	--
Chile	217	5,423	7,596	2,597	77
Peru	3,115	1,093	4,407	1,175	1,265
Venezuela	--	--	--	--	664
Netherlands	--	--	433	166	--
India	--	--	--	3	--
Japan	--	--	11	218	524
Philippines	16,921	17,605	9,270	6,313	--
Saudi Arabia	60	--	--	--	--
Taiwan	--	--	--	18	--
Botswana	--	--	1	--	--
South Africa	--	59	363	--	108
Zimbabwe	--	6	--	--	--
Australia	918	3,269	2,786	1,998	2,150
Blister Copper	**81,268**	**114,021**	**87,588**	**66,340**	**28,635**
Canada	27	29,542	4,547	5	2,559
Mexico	8,046	4,772	10,206	7,610	2,117
Argentina	--	--	1,808	--	--
Chile	41,825	67,172	66,255	51,555	19,823
Peru	17,799	11,213	3,803	6,902	3,819
Belgium	23	1,147	--	--	--
Germany, F.R.	38	116	19	76	72
Sweden	1,087	--	--	--	--
United Kingdom	20	11	--	--	--
Japan	3,855	--	--	--	--
Egypt	--	--	854	--	--
Australia	8,548	--	--	--	--
Other Countries	--	48	96	192	245
Refined Cathodes & Shapes	**391,208**	**313,909**	**532,399**	**555,968**	**415,675**
Canada	93,548	72,046	100,669	202,957	141,085
Mexico	4,816	3,111	--	--	1,780
Argentina	1,102	--	--	--	--
Chile	149,480	182,003	297,368	169,826	167,548
Peru	52,576	14,920	34,458	58,509	38,714
Belgium	2,133	1,166	6,363	13,359	5,865
Finland	--	--	78	139	119
France	60	--	20	63	43
Germany, F.R.	145	7	1,097	441	1,209

-continued-

TABLE XV continued

Italy	--	--	21	20	--
Netherlands	--	--	40	80	--
Norway	416	2,265	279	1,959	886
Sweden	20	20	--	--	--
United Kingdom	643	358	346	41	3,541
Yugoslavia	2,698	--	--	--	--
Japan	7,062	15	10,120	4,163	5,241
South Korea	--	2,205	3,307	910	2,393
Philippines	--	--	--	1,050	--
Ghana	--	--	3,816	--	--
South Africa	--	--	15,114	555	6,453
Zaire	27,212	24,535	32,082	30,907	30,057
Zambia	49,144	10,368	27,221	64,501	9,821
Australia	--	--	--	3,270	8
U.S.S.R.	--	728	--	--	--
Hungary	--	60	--	--	--
Other Countries	153	102	--	3,218	912
Waste & Scrap (unalloyed)	**19,443**	**18,056**	**25,450**	**25,362**	**25,368**
Waste & Scrap (alloyed)	**19,334**	**20,760**	**34,597**	**34,267**	**25,591**
Copper in Rolls, Sheets or Rods	**26,728**	**24,056**	**26,620**	**43,007**	**41,870**
Canada	8,002	5,324	6,027	12,014	14,202
Mexico	150	97	188	11	134
Brazil	502	2,199	2,829	3,792	2,333
Chile	1,286	479	1,220	1,949	1,486
Peru	472	310	299	662	909
Belgium	410	467	226	169	1,068
Finland	1,156	1,487	1,147	2,715	2,208
France	3,586	2,213	2,264	1,916	1,808
Germany, F.R.	3,170	2,930	4,182	10,020	7,451
Italy	35	24	347	1,401	975
Netherlands	--	32	57	50	129
Sweden	1,445	1,583	1,389	2,408	3,151
Switzerland	--	6	6	65	38
United Kingdom	181	105	91	166	135
Yugoslavia	479	305	883	433	696
Japan	3,232	4,147	3,392	4,604	3,559
South Africa	--	--	265	143	412
Australia	2,067	2,059	1,038	264	154
Other Countries	555	289	770	225	1,022
Copper Seamless Tube & Tubing	**16,816**	**17,762**	**27,499**	**32,694**	**32,398**
Canada	2,619	2,107	3,778	5,767	5,502
Mexico	60	948	5,449	3,281	955
Brazil	--	--	--	707	224
Chile	220	155	140	151	297
Finland	--	--	--	714	970
France	--	--	--	183	219

-continued-

TABLE XV continued

Germany, F.R.	908	427	327	729	837
Switzerland	1	2	5	6	7
United Kingdom	50	47	27	164	126
Japan	12,521	13,525	16,840	20,394	22,833
Other Countries	437	551	933	598	428
Brass Rods, Sheets, Plates, Bars & Strip	**76,588**	**49,226**	**58,297**	**93,024**	**68,028**
Canada	5,591	3,723	3,580	5,572	3,482
Mexico	190	565	1,795	1,234	190
Argentina	323	790	198	329	695
Brazil	3,016	3,103	5,813	15,101	8,929
Belgium	240	243	289	404	409
Finland	--	66	66	18	--
France	14,583	4,936	5,470	12,363	6,081
Germany, F.R.	23,508	16,095	19,764	26,906	18,575
Italy	385	469	1,384	3,182	3,591
Netherlands	7,275	4,202	4,247	6,728	5,449
Sweden	549	324	290	607	1,808
Switzerland	1,309	996	1,343	1,432	1,789
United Kingdom	2,488	1,778	810	1,403	686
Yugoslavia	1,723	717	939	2,306	1,557
Israel	1,472	1,231	1,259	1,322	1,141
Japan	8,525	6,561	8,159	7,059	7,481
South Africa	245	453	819	1,188	648
Australia	25	39	9	48	58
Hungary	--	610	858	796	539
Other Countries	5,141	2,325	1,205	5,026	4,920
Copper & Alloyed Foil (a)	**29,800**	**25,533**	**28,008**	**39,717**	**33,951**
Canada	5,436	4,966	5,205	7,900	5,763
Belgium	9	113	93	46	--
France	1,051	522	308	544	36
Germany, F.R.	254	766	769	2,061	1,033
Netherlands	7,183	7,442	7,976	9,047	8,968
Sweden	13,198	9,448	10,529	13,785	13,732
United Kingdom	1,143	653	1,109	2,488	631
Japan	1,289	1,359	1,661	2,533	2,303
Other Countries	237	264	358	1,313	1,485
Brass Seamless Tube & Tubing	**16,175**	**13,996**	**17,259**	**22,798**	**20,212**
Canada	1,556	1,018	3,447	4,303	2,443
Mexico	2	423	143	672	185
Brazil	386	462	174	500	359
France	321	173	335	77	39
Germany, F.R.	8,639	6,489	7,919	10,457	9,340
Greece	90	72	59	225	116
Italy	2	165	252	504	1,282
Netherlands	22	1	--	392	250
Spain	101	137	2	9	2

-continued-

TABLE XV continued

Switzerland	19	17	12	19	44
United Kingdom	217	295	132	326	211
Yugoslavia	391	152	307	674	592
Israel	175	203	156	270	311
Japan	2,706	2,966	3,897	3,619	3,665
South Korea	464	281	175	459	444
South Africa	567	683	44	4	699
Other Countries	517	459	205	288	230
Copper Alloyed Wire	**3,711**	**4,569**	**4,334**	**5,362**	**4,757**
Copper Wire Insulated (b)	**28,785**	**30,001**	**44,977**	**68,190**	**83,016**
Canada	12,217	11,949	22,704	36,057	36,393
Mexico	3,054	2,376	2,129	5,592	6,683
Brazil	281	--	2,317	3,893	5,904
Chile	736	836	669	132	918
Peru	2,325	2,320	1,156	356	5,251
France	505	462	1,129	1,699	2,598
Germany, F.R.	567	658	614	1,127	921
Italy	629	722	1,016	2,169	3,111
Spain	19	25	258	1,025	3,227
Sweden	97	6	62	49	85
United Kingdom	707	1,498	1,085	789	718
Yugoslavia	4,474	4,299	2,846	1,837	2,595
Israel	165	307	472	732	810
Japan	833	1,834	4,952	3,396	3,149
South Korea	352	580	794	488	3,274
Other Countries	1,824	2,129	2,774	8,849	7,379

Source: American Bureau of Metal Statistics Inc., U.S. Bureau of the Census
Current monthly data available, report 010, for the above table on an annual subscription basis.
(a) Metal weight. (b) Gross weight.

COPPER EXPORTS OF THE UNITED STATES BY COUNTRIES

Copper Content - Short Tons

	1981	1982	1983	1984	1985
Ore, Concentrate & Matte	**166,207**	**215,256**	**47,110**	**67,240**	**128,206**
Canada	6,034	708	92	87	3,050
Venezuela	--	--	--	1	--
Belgium	20	--	--	212	100
Germany, F.R.	179	18,420	7,696	1,694	--
Netherlands	--	--	--	11	--
India	--	--	124	33	--

-continued-

TABLE XV continued

Germany, F.R.	1,430	1,537	757	3,270	18,654
Italy	--	--	--	839	7,553
Netherlands	118	622	172	1,085	4,395
Spain	2,303	4,351	399	2,058	5,292
Sweden	116	807	61	487	234
United Kingdom	770	2,115	486	572	4,303
Hong Kong	100	--	79	446	1,590
India	4,692	6,179	2,563	1,288	1,102
Japan	7,810	7,409	3,822	16,878	14,829
South Korea	17,490	17,117	16,348	14,528	15,284
Taiwan	2,246	1,475	1,341	17,539	27,650
Thailand	79	--	9	8	8
Australia	--	--	--	78	58
Other Countries	689	501	49	419	2,864
Copper-Base Alloy, Waste & Scrap (a)	**105,987**	**100,966**	**88,472**	**115,659**	**160,791**
Canada	11,355	12,598	19,117	33,638	26,421
Mexico	4,075	1,453	6,016	2,655	4,239
Venezuela	--	--	1	262	374
Belgium	5,577	4,863	5,229	3,422	6,960
France	198	471	299	224	227
Germany, F.R.	13,364	8,044	2,909	3,996	18,814
Italy	170	57	3	2,695	9,804
Netherlands	262	1,766	2,154	664	4,315
Spain	5,338	6,060	490	1,391	7,638
Sweden	709	2,281	5,897	2,821	1,994
Switzerland	81	448	495	513	713
United Kingdom	1,547	1,281	482	601	2,296
Yugoslavia	--	--	--	--	132
Hong Kong	320	20	391	258	1,285
India	13,173	12,241	4,289	9,113	15,235
Japan	24,945	20,503	17,765	28,111	27,328
South Korea	6,388	17,733	9,421	8,315	13,692
Singapore	--	--	155	771	344
Taiwan	15,638	7,739	13,291	16,023	16,231
Other Countries	2,847	3,408	68	186	2,749
Copper & Alloyed Foil	**1,072**	**775**	**223**	**327**	**195**
Canada	113	163	84	114	12
Germany, F.R.	--	119	13	6	6
Japan	60	30	9	11	22
South Korea	--	--	7	5	6
Taiwan	683	365	33	171	76
Other Countries	216	98	77	20	73
Pipes & Tubes	**12,057**	**5,047**	**3,991**	**4,270**	**5,004**
Plates & Sheets	**2,573**	**13,038**	**1,511**	**5,122**	**866**

-continued-

TABLE XV continued

Israel	--	--	--	2	--
Japan	128,707	163,418	32,330	62,004	113,352
South Korea	--	1,718	--	3,195	7,628
Saudi Arabia	--	--	--	1	--
Taiwan	9,293	--	6,868	--	4,076
Other Countries	21,974	30,992	--	--	--
Blister Copper	**10,169**	**2,213**	**8,213**	**9,237**	**19,817**
Canada	5,804	484	397	430	408
Mexico	37	1,557	15	47	2,804
Chile	--	--	28	4	--
Austria	--	--	--	556	--
Belgium	66	--	26	784	--
Germany, F.R.	1,096	1	141	257	100
Netherlands	--	--	--	276	--
Hong Kong	--	--	68	213	6
Japan	1,932	6	8	18	--
South Korea	25	57	7,194	6,480	16,177
Singapore	--	--	15	72	76
Other Countries	1,209	108	321	100	246
Refined Ingots, Bars, Etc.	**30,946**	**38,554**	**96,482**	**103,532**	**53,037**
Canada	7,610	3,921	2,739	4,513	6,165
Mexico	10,613	1,223	9,613	3,288	12,729
Brazil	936	416	3	123	53
Venezuela	57	276	19	13	27
Belgium	27	1,278	812	51	671
France	1,562	1,222	708	955	318
Germany, F.R.	1,267	2,088	2,423	1,401	1,439
Netherlands	141	6,414	66,941	7,387	19,343
Spain	993	200	69	126	2
Sweden	160	71	134	9	76
Switzerland	86	47	65	46	40
United Kingdom	1,494	1,476	486	1,080	806
Hong Kong	--	--	32	168	1,050
India	--	--	86	32	24
Israel	--	132	13	14	30
Japan	4,568	1,116	8,031	78,568	5,605
South Korea	348	399	6	1,737	1,146
Singapore	--	--	3	64	--
Taiwan	148	125	1,130	3,539	1,609
Australia	34	8	14	7	4
China	--	17,713	2,375	55	25
Other Countries	902	429	780	356	1,875
Copper Waste & Scrap (unalloyed)	**55,202**	**59,987**	**52,897**	**89,075**	**148,040**
Canada	10,299	11,096	14,742	12,399	18,277
Mexico	5,845	3,109	9,373	14,915	13,507
Brazil	139	556	--	--	1,875
Belgium	854	3,052	2,677	2,209	10,383

-continued-

TABLE XV continued

France	222	61	19	57	182
Germany, F.R.	1,430	1,537	757	3,270	18,654
Italy	--	--	--	839	7,553
Netherlands	118	622	172	1,085	4,395
Spain	2,303	4,351	399	2,058	5,292
Sweden	116	807	61	487	234
United Kingdom	770	2,115	486	572	4,303
Hong Kong	100	--	79	446	1,590
India	4,692	6,179	2,563	1,288	1,102
Japan	7,810	7,409	3,822	16,878	14,829
South Korea	17,490	17,117	16,348	14,528	15,284
Taiwan	2,246	1,475	1,341	17,539	27,650
Thailand	79	--	9	8	8
Australia	--	--	--	78	58
Other Countries	689	501	49	419	2,864
Copper-Base Alloy, Waste & Scrap (a)	**105,987**	**100,966**	**88,472**	**115,659**	**160,791**
Canada	11,355	12,598	19,117	33,638	26,421
Mexico	4,075	1,453	6,016	2,655	4,239
Venezuela	--	--	1	262	374
Belgium	5,577	4,863	5,229	3,422	6,960
France	198	471	299	224	227
Germany, F.R.	13,364	8,044	2,909	3,996	18,814
Italy	170	57	3	2,695	9,804
Netherlands	262	1,766	2,154	664	4,315
Spain	5,338	6,060	490	1,391	7,638
Sweden	709	2,281	5,897	2,821	1,994
Switzerland	81	448	495	513	713
United Kingdom	1,547	1,281	482	601	2,296
Yugoslavia	--	--	--	--	132
Hong Kong	320	20	391	258	1,285
India	13,173	12,241	4,289	9,113	15,235
Japan	24,945	20,503	17,765	28,111	27,328
South Korea	6,388	17,733	9,421	8,315	13,692
Singapore	--	--	155	771	344
Taiwan	15,638	7,739	13,291	16,023	16,231
Other Countries	2,847	3,408	68	186	2,749
Copper & Alloyed Foil	**1,072**	**775**	**223**	**327**	**195**
Canada	113	163	84	114	12
Germany, F.R.	--	119	13	6	6
Japan	60	30	9	11	22
South Korea	--	--	7	5	6
Taiwan	683	365	33	171	76
Other Countries	216	98	77	20	73
Pipes & Tubes	**12,057**	**5,047**	**3,991**	**4,270**	**5,004**
Plates & Sheets	**2,573**	**13,038**	**1,511**	**5,122**	**866**

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TABLE XV continued

Unalloyed Copper Bars, Angles, Shapes, Sections & Rods	20,338	10,295	10,405	13,338	7,396
Wire & Cable, Bare	7,743	8,326	9,163	9,677	8,775
Insulated Wire & Cable (b)	89,538	70,070	67,714	65,136	54,754
Building Wire & Cable	5,288	4,541	6,004	3,879	2,265
Power Wire & Cable	14,968	11,777	7,388	6,622	6,852
Communication Wire & Cable	27,590	22,625	23,825	21,211	13,489
Copper Magnet Wire	4,121	3,595	3,679	3,589	2,905
Appliance Wire & Cord	4,086	3,026	5,779	4,511	5,950
Other Insulated Wire & Cable	33,485	24,506	21,039	25,324	23,293
Blister Copper (c)	6	1	--	--	7
Refined Copper (c)	35,081	1,178	718	2,006	16,736
Canada	166	1,156	661	9	12
Mexico	--	--	54	1,005	--
Brazil	--	--	--	--	369
Germany, F.R.	--	22	--	--	--
Netherlands	--	--	--	--	10,148
Japan	34,915	--	3	551	--
Taiwan	--	--	--	441	--
China	--	--	--	--	6,207

Source: American Bureau of Metal Statistics Inc., U.S. Bureau of the Census
Current monthly data available, report 011, for the above table on an annual subscription basis.
(a) Metal weight. (b) Gross weight. (c) Re-exports, imported foreign merchandise.

TABLE XVI

"COVERED EMPLOYMENT" AND WAGES IN ARIZONA COPPER MINING AND SMELTING

Year	Average No. Covered Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage	Tons Copper Ore
1948	11,493	41,318,524	3,595	69.13	39,072,204
1949	11,001	40,612,224	3,692	71.00	37,365,611
1950	10,181	41,994,321	4,125	79.33	41,757,273
1951	10,754	47,825,698	4,447	85.52	42,784,388
1952	11,365	54,950,235	4,835	93.14	44,472,522
1953	12,068	62,742,982	5,199	99.98	45,187,838
1954	12,502	65,518,853	5,241	100.79	43,072,894
1955	12,399	71,293,263	5,750	110.58	52,189,728
1956	14,008	83,568,996	5,966	114.73	60,468,580
1957	14,652	85,125,320	5,809	111.71	59,571,834
1958	14,100	74,726,972	5,300	101.93	56,255,809
1959	11,568	72,095,130	6,232	119.85	53,121,545
1960	13,764	90,312,848	6,562	126.19	66,032,439
1961	14,275	97,271,286	6,814	131.04	71,918,991
1962	14,408	101,920,108	7,074	136.04	78,868,147
1963	14,303	104,291,588	7,292	140.23	80,615,132
1964	14,720	113,792,031	7,730	148.65	86,132,039
1965	15,239	122,163,124	8,016	154.16	92,859,535
1966	17,018	137,187,611	8,061	155.02	101,558,298
1967	13,426	108,427,206	8,076	155.31	74,289,203
1968	15,734	136,089,579	8,649	166.33	101,293,963
1969	19,459	173,183,018	8,900	171.15	127,848,828
1970	21,479	201,665,064	9,389	180.56	150,241,000
1971	21,231	211,978,597	9,984	192.00	149,294,000
1972	23,233	254,717,341	10,964	210.85	165,914,825 2/
1973	25,494	291,294,328	11,426	218.89	181,311,945
1974	27,894	340,832,096	12,219	234.98	178,913,296

-continued-

TABLE XVI continued

"COVERED EMPLOYMENT" AND WAGES IN ARIZONA COPPER MINING AND SMELTING

Year	Average Covered Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage	Tons Copper Ore
1975	25,950	363,349,178	14,002	269.27	168,750,152
1976	25,631	405,289,034	15,812	304.08	194,136,559
1977	23,373	398,539,789	16,835	323.75	168,641,401
1978	21,092	397,790,419	18,860	362.69	178,204,491
1979	23,239	494,963,476	21,299	409.60	203,997,408
1980	21,602	510,168,454	23,617	454.17	169,650,401
1981	26,031	687,434,789	26,408	507.85	216,787,430
1982	17,182	487,415,292	28,368	545.53	135,768,647
1983	13,864	395,266,852	28,510	548.29	135,301,652
1984	12,556	387,028,537	30,824	592.77	145,278,431
1985	11,155	349,311,047	31,314	602.19	174,218,218

Source: This report, Table XVII; "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines; Research and Statistics Unit, Arizona Department of Economic Security.

1/ "Covered Employment" by law includes all employees of employers of three or more persons. Prior to 1966 only a portion of the workers in smelting, refining and rod fabrication were included in this table.

2/ Mine production in short tons of lode ore from "Arizona, Mine Production by Class of Ore", reported by U.S. Bureau of Mines. In 1982 and thereafter the tonnage may include copper-zinc, copper-lead and lead-zinc ore combined to avoid disclosing individual company confidential data.

TABLE XVII

ARIZONA INDUSTRIES COVERED BY SOCIAL SECURITY

YEAR - 1985

Industry	Average Number of Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage
Copper Mining	9,353	291,140,088	31,128	598.62
Copper Smelting, Refining & Rod Fabrication	1,802	58,170,959	32,281	620.80
TOTAL COPPER MINING & PROCESSING	11,155	349,311,047	31,314	602.20
Other Mining, Quarrying & Processing	2,596	75,474,375	29,073	559.10
ALL MINING, QUARRYING & PROCESSING	13,751	424,785,422	30,891	594.06
Mfg. Except Copper Processing	179,751	4,212,600,738	23,436	450.69
Construction	112,113	2,212,090,989	19,731	379.44
Transportation, Utilities, etc. 2/	54,058	1,310,190,620	24,237	466.09
Wholesale-Retail Trade	296,672	4,168,194,592	14,050	270.19
Services, Finance & Misc.	365,832	6,102,359,129	16,681	320.78
Agriculture & Related Services	29,426	323,172,062	10,983	211.20
Federal, State & Local Government	206,405	4,230,510,714	20,496	394.16
TOTAL AND AVERAGES	1,238,008	22,983,904,266	18,565	357.02

Source: Research and Statistics Unit, Arizona Department of Economic Security

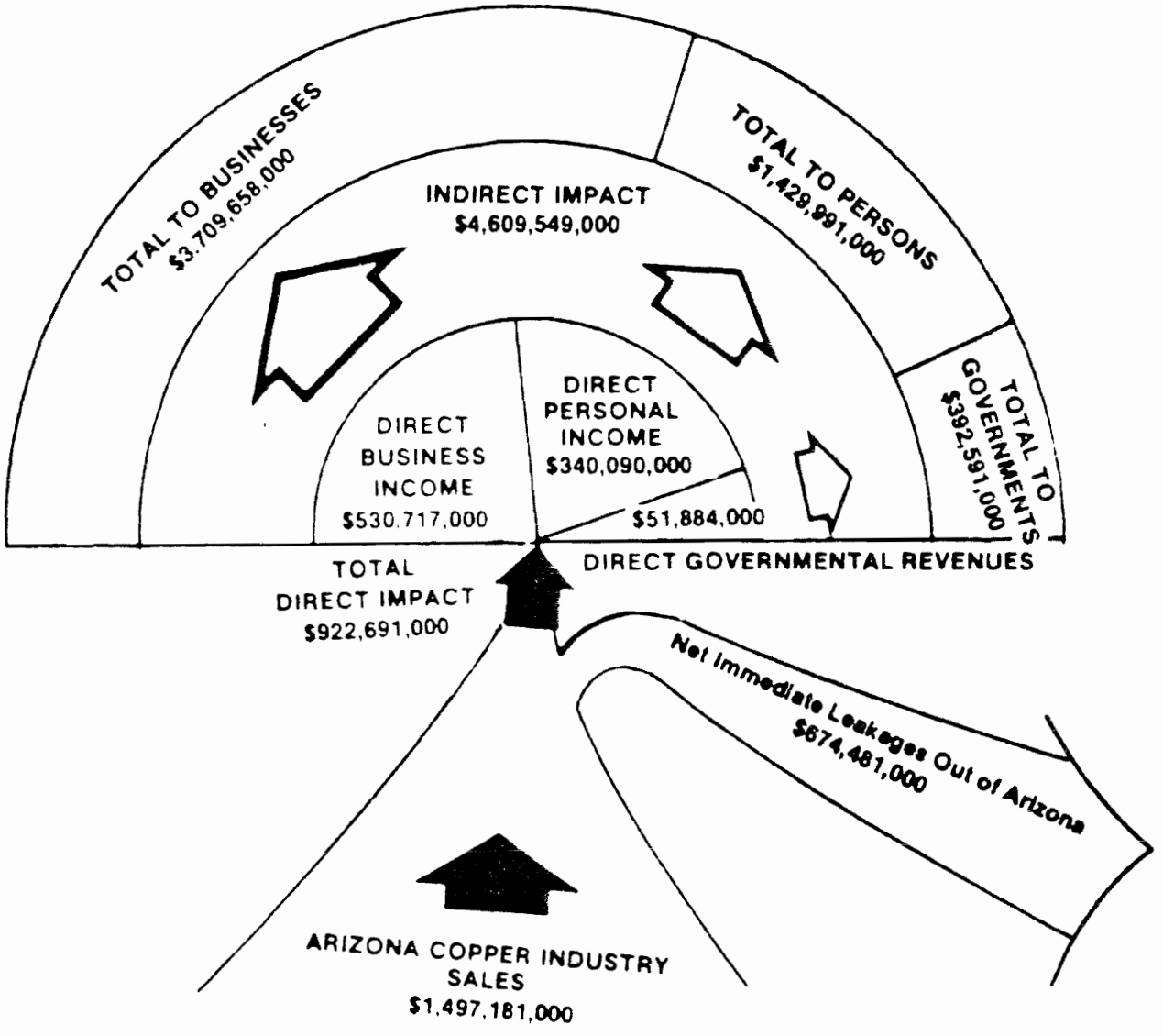
1/ Includes all covered employees.

2/ Transportation exclusive of railroads.

TABLE XVIII

DIRECT AND INDIRECT IMPACTS OF THE COPPER INDUSTRY ON THE ARIZONA ECONOMY 1985

TOTAL IMPACT: $5,532,240,000



Circulation and recirculation of the direct impact of copper industry spending creates a "ripple effect" that expands the direct economic impact of the copper industry in Arizona to a total impact that is six times greater than the direct impact.

Source: "The Copper Industry's Impact on the Arizona Economy -- 1985" by George F. Leaming, Western Economic Analysis Center, Marana, AZ.

TABLE XIX

EMPLOYMENT, EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA 1/

Period	All Employees Average No. (Thousands) 2/ Ariz.	3/ U.S.	PRODUCTION WORKERS Average No. (Thousands) 4/ Ariz.	5/ U.S.	Average Weekly Earnings Ariz.	U.S.	Average Weekly Hours Ariz.	U.S.	Average Hourly Earnings 6/ Ariz.	U.S.	Average Earnings Per Man Per Year 7/ Ariz.	U.S.	Aggregate Man Hours (Thousands) 8/ Ariz.	U.S.
1970	18.8	37.0	14.9	29.5	173.01	175.67	43.8	44.7	3.95	3.93	8,997	9,135	33,936	68,570
1971	18.9	34.7	14.9	26.8	178.50	178.46	42.4	42.9	4.21	4.16	9,282	9,280	32,852	59,785
1972	20.5	38.9	16.1	30.7	194.69	192.19	41.6	41.6	4.68	4.62	10,124	9,994	34,827	66,410
1973	21.5	42.3	17.6	33.7	206.75	206.42	41.6	42.3	4.97	4.88	10,751	10,734	38,072	74,127
1974	24.0	42.8	19.1	33.8	222.16	226.46	39.6	41.1	5.61	5.51	11,552	11,776	39,331	72,237
1975	22.5	37.1	17.9	28.4	247.43	247.14	38.6	39.2	6.41	6.33	12,866	12,903	35,929	57,891
1976	21.7	35.5	17.2	27.0	286.31	280.70	40.1	40.1	7.14	7.00	14,888	14,596	35,865	56,300
1977	19.3	35.1	15.3	26.9	302.99	288.73	39.4	38.6	7.69	7.48	15,755	15,014	31,347	53,994
1978	17.2	35.2	13.7	26.9	344.76	338.40	40.8	40.0	8.45	8.46	17,928	17,597	29,066	55,952
1979	19.3	31.9	15.3	24.6	404.81	405.03	42.3	42.5	9.57	9.53	21,050	21,061	33,654	54,366
1980	17.7	29.4	14.0	22.6	446.19	435.01	41.7	41.0	10.70	10.61	23,202	22,621	30,358	48,183
1981	21.9	36.2	17.4	27.9	497.28	492.54	41.2	41.6	12.07	11.84	25,859	25,612	37,278	60,353
1982	15.2	25.3	12.1	18.5	495.60	484.91	38.3	38.7	12.94	12.53	25,771	25,215	24,098	37,229
1983	11.3	19.8	9.0	14.2	519.25	522.69	39.1	39.9	13.28	13.10	27,001	27,180	18,299	29,462
1984	10.5	17.3	8.2	12.1	553.83	562.74	41.3	41.5	13.41	13.56	28,799	29,002	17,610	26,112
1985	9.4	13.4	7.5	9.7	573.80	574.76	41.4	42.2	13.86	13.62	29,838	29,888	16,146	21,286

-continued-

TABLE XIX CONTINUED

EMPLOYMENT, EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA

Period	Copper Ore Mined (Thousand Short Tons)		Copper Produced (Recoverable Content) (Thousand Pounds)		Worker Productivity: Copper Ore Mined Per Man-Hour (Tons)		Worker Productivity: Copper Produced Per Man-Hour (Pounds)	
	Ariz.	U.S.	Ariz.	U.S.	Ariz.	U.S.	Ariz.	U.S.
1970	150,241	257,729	1,826,734	3,368,957	4.427	3.759	53.829	49.132
1971	149,294	242,656	1,633,568	2,986,599	4.544	4.059	49.725	49.996
1972	165,815	266,831	1,816,118	3,264,113	4.761	4.017	52.161	49.151
1973	173,605	289,998	1,847,635	3,386,357	4.872	3.912	48.530	45.683
1974	178,821	293,443	1,710,744	3,145,148	4.547	4.062	43.496	43.539
1975	168,656	263,003	1,619,535	2,772,111	4.694	4.543	45.076	47.885
1976	194,046	283,736	2,043,168	3,166,889	5.410	5.040	56.968	56.250
1977	168,601	259,974	1,843,949	2,964,539	5.379	4.815	58.824	54.905
1978	178,201	263,722	1,965,072	2,955,210	6.131	4.713	67.607	52.817
1979	203,977	291,078	2,085,556	3,140,110	6.061	5.369	61.971	57.759
1980	169,650	241,090	1,669,495	2,527,920	5.588	5.004	54.994	52.465
1981	216,787	306,089	2,294,437	3,354,548	5.815	5.072	61.549	55.582
1982	146,125	200,589	1,697,500	2,507,070	6.064	5.388	70.442	67.342
1983	152,902 a/	196,203 b/	1,514,538 a/	2,288,612	8.356	6.660	82.766	77.680
1984	145,278 a/	189,499 b/	1,583,505 a/	2,405,866	8.250	7.257	89.921	92.136
1985	174,218 a/	239,399 b/	1,778,334 a/	2,443,675	10.790	11.247	110.141	114.802

a/ Table I this publication.

b/ U.S. Bureau of Mines.

-continued-

TABLE XIX CONTINUED

EMPLOYMENT, EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA 1/

1/ Statistics do not reflect workers in copper smelting, refining and rod fabrication.

2/ These figures are estimates made by the Arizona Department of Economic Security, in cooperation with the U.S. Bureau of Labor Statistics, and they include all full and part-time wage and salary workers who were employed in copper mining in any part of the pay periods which included the 12th of each month of the year.

3/ Estimates made by the U.S. Bureau of Labor Statistics, in cooperation with the 50 states, and based upon monthly samplings similar to those in 2/ above, adjusted periodically to census bench mark.

4/ Estimates of production (non-supervisory) workers based upon samplings as in 2/ above. Since 1975, figures have been calculated by the Arizona Department of Mines and Mineral Resources dividing the annual number of "All Employees-Arizona" by a factor of 1.26. This factor was derived by comparing the annual number of "All Employees-Arizona" with "Production Workers - Arizona" from 1970 to 1974.

5/ Earnings figures for a particular year is the product of "Average Hourly Earnings" and "Average Weekly Hours" for that year.

6/ Gross payroll aggregates, exclusive of irregular bonuses and other pay not earned in a sample pay period, are divided by gross man-hour aggregates of production and related workers for the period in order to determine average hourly earnings.

7/ "Average Weekly Earnings" times 52 weeks.

8/ Number of production workers times "Average Weekly Hours" times 52 weeks.

Source: Research and Statistics Unit, Arizona Department of Economic Security: "Minerals Yearbook - Metals, Minerals",U.S. Bureau of Mines. "Employment and Earnings", March issues, U.S. Department of Labor.

TABLE XX

REFINED COPPER INVENTORIES AT YEAR END
AMOUNTS IN THOUSANDS OF SHORT TONS

Where Held	1981	1982	1983	1984	1985
U.S. refineries	151.0	210.1	66.1	193.4	150.4
Comex warehouses	187.6	274.4	409.2	276.3	120.3
Total U.S.	338.6	484.5	475.3	469.7	270.7
Refineries elsewhere	292.9	420.8	352.6	285.7	330.0
LME warehouses	139.6	279.1	480.2	139.3	209.1
Total elsewhere	432.5	699.9	832.8	425.0	539.1
Aggregate inventories ...	771.1	1184.4	1308.1	894.7	809.8

Source: American Bureau of Metal Statistics. Figure for "refineries elsewhere" as of Nov. 30, 1985. All other 1985 figures for Dec. 31, 1985.

TABLE XXI
AVERAGE QUOTED PRICE OF
ELECTROLYTIC COPPER WIREBAR
DOMESTIC, DELIVERED
U.S. /lb. 1/

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
JANUARY	62.625	66.240	62.625	76.574	119.385	88.570	78.634	80.219	68.792	64.487
FEBRUARY	63.625	68.625	63.593	89.697	133.808	86.071	78.779	84.024	70.748	66.446
MARCH	64.682	72.551	62.410	96.718	106.040	87.382	75.862	82.072	75.311	65.547
APRIL	69.241	74.393	64.625	98.322	94.851	88.033	76.273	83.493	77.388	70.318
MAY	70.625	72.606	64.768	91.234	93.479	85.798	77.948	85.634	72.229	69.864
JUNE	70.625	71.199	66.569	88.241	92.713	85.226	71.488	81.836	69.849	67.094
JULY	74.625	67.996	64.079	86.768	103.565	84.412	71.053	82.947	64.402	66.773
AUGUST	74.625	63.792	67.232	91.335	100.708	87.387	70.999	80.542	64.535	66.284
SEPTEMBER	74.625	60.625	67.632	95.853	98.864	84.722	71.065	77.587	63.408	65.716
OCTOBER	72.064	60.625	70.495	99.106	99.471	82.312	72.413	73.392	62.039	66.680
NOVEMBER	70.625	60.625	71.191	99.708	96.982	81.216	72.968	69.581	65.650	66.294
DECEMBER	65.774	61.942	71.897	106.448	89.127	80.293	74.230	70.805	63.538	68.025

Source: Metals Week

1/ MW US Producer Delivered.

Prepared by: State of Arizona Joint Legislative Budget Committee Staff.

TABLE XXII

AVERAGE COPPER CASH PRODUCTION COSTS FOR THE UNITED STATES, 1981-84[1]

(Cents per pound of copper)

PRODUCT COSTS	1981	1982	1983	1984	Long run[2]
Mine op. cost	32	26	22	20	26
Mill-Float op. cost	27	24	24	23	22
Mill-Leach op. cost	8	9	7	7	5
Smelt/Refine/Transportation	28	28	26	24	24
Taxes[3]	3	3	3	2	3
Total Cost	98	90	82	76	80
Byproduct Credits	(19)	(13)	(13)	(11)	(11)
Cash Cost[4]	79	77	69	65	69
Production[5] Thousand Short Tons of Copper	1,365	989	1,027	e 1,105	1,504

e Estimated.

1 Includes 16 mines, most of which were producing from 1981 to 1984.

2 Long run costs include depreciation allowances to sustain production.

3 Property and severance taxes and royalties, if applicable.

4 Includes all cash cost of production and credit for byproducts but excludes depreciation and profit (except long run costs). Costs are in actual dollars for each year shown.

5 Based on the production of the 16 mines analyzed. Long run production is estimated full capacity level. Capacities are averaged over the life of the mine.

Source: U. S. Bureau of Mines Preprint from Bulletin 675 Chapter on Copper. Mineral Facts and Problems, 1985 Edition.

TABLE XXIII

COPPER RESERVE BASE IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
ANAMAX MINING CO.	Helvetia	Sulfide	320	0.64	Pub. 1973; cutoff at 0.3% Cu.
	Helvetia	Oxide	20	0.55	Pub. 1973; acid soluble Cu; cutoff at 0.3% acid soluble Cu.
	Peach Elgin	Mixed	23	0.75	Pub. 1973; cutoff at 0.4% Cu.
	Twin Buttes & Palo Verde	Sulfide	106	0.69	Pub. in Amax Inc. 1984 Annual Report.
	Twin Buttes & Palo Verde	Oxide	16	0.82	Pub. in Amax Inc. 1984 Annual Report.
ANTIOCH RESOURCES	Zonia	Oxide	35	0.31	Unpublished estimate.
ASARCO INC.	Mission Complex (Mission, San Xavier, Pima & Eisenhower)	Sulfide	286	0.76	With 0.13 oz/ton Ag. Pub. ASARCO 1985 Annual Report.
	Poston Butte	Mixed		0.47	32-42 mission tons possible. Pub. 1984 E&MJ 1972.
	Sacaton East (UG)	Sulfide	16	1.20	Pub. in ASARCO Inc. 1983 Annual Report.
	Silver Bell	Sulfide	21	0.68	With .07 oz/ton Ag. Pub. in 1985 Annual Report.
BS & K MINING CO.	Atlas	Mixed			Withheld by request.
CASA GRANDE COPPER CO.	Casa Grande	Mixed	352	1.00	Pub. in Getty Oil Co. 1980 Annual Report.
CF & I STEEL CORP.	Dragoon	Oxide			Withheld by request.
COCHISE DEV. GROUP	Bisbee-North	Mixed (?)	20	0.80	Unpublished estimate.
COCHISE MINING CORP.	San Juan	Oxide	20	0.50	Unpublished estimate.

TABLE XXIII CONTINUED

COPPER RESERVE BASE IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
CONOCO INC.	Poston Butte	Mixed	800	0.40	Pub. 1979 from Copper Studies Inc.
CYPRUS MINES CORP.	Bagdad	Sulfide	306	0.50	With 0.018% Mo.
	Bagdad	Oxide	38	0.33	Acid soluble Cu.
	I-10	Mixed	100	0.52	Unpublished estimate; with 0.02% Mo.
	Johnson	Oxide	4	0.40	Acid soluble Cu. Pub. in 1985 E&MJ International Directory.
DORE MINING & MILLING	Four Metals	Sulfide	3	0.82	Reported 1965.
A. DURHAM ET. AL.	Strong & Harris	Mixed	60	0.60	Unpublished estimate with 0.70% Zn.
DUVAL CORPORATION	Esperanza	Sulfide	48	0.27	With .034% Mo.
	Mineral Park	Sulfide	35	0.17	With .054% Mo.
	Sierrita	Sulfide	257	0.30	With .035% Mo. Pennzoil 1981 10K Report less production 1982-1985.
HARPOON, INC.	Sanchez	Oxide	116	0.37	Unpublished report.
HOPE MINING & MILLING CO.	Mame	Oxide	2	1.00	Unpublished estimate.
INSPIRATION CONSOLIDATED COPPER CO.	Christmas (OP)	Sulfide	7	0.63	Pub. in Inspiration Resources 1983 Form 10-K, p. 8.
	Christmas (UG)	Sulfide	20	1.82	(Same as above)
	Inspiration Area Mines	Mixed	222	0.52	Pub. in Insp. Res. 1985 Form 10-K.
KENNECOTT	Chilito	Mixed			Withheld by request.
	Lone Star	Mixed	1065	0.58	World Mining, May 1981.
	Ray	Sulfide	538	0.70	Estimated.
	Ray	Silicate	200	0.68	Estimated

TABLE XXIII CONTINUED

COPPER RESERVE BASE IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
KERR McGEE CORP.	Red Mountain	Sulfide		0.71	Pub. 1970; 100 million tons possible.
KEYSTONE MINERALS INC.	Korn Kob	Oxide	8	0.50	Pub. in "Pay Dirt" July 1973.
MAGMA COPPER CO.	Copper Creek	Sulfide			Withheld by request.
	Kalamazoo	Sulfide	254	0.71	Proven & probable; 1985 Newmont Annual Report; 0.029 oz/ton Ag.
	Kalamazoo	Sulfide shaft pillar	101		1985 Newmont Annual Report.
	San Manuel	Sulfide	194	0.69	Proven & probable; 1985 Newmont Annual Report; 0.029 oz/ton Ag.
		Sulfide shaft pillar	103		1984 Newmont Annual Report.
		Oxide	56	0.47	Proven & probable; 1985 Newmont Annual Report.
		Oxide (Subsidence Area)	170	0.36	1985 Newmont Annual Report.
	Superior	Sulfide	4	5.69	Proven & probable; 1984 Newmont Annual Report; 0.71 oz/ton Ag. (Written off 1985)
NAVAJO TRIBE (?)	White Mesa	Oxide	2	0.75	Pub. 1955.
NORANDA MINES LTD.	Lakeshore	Sulfide (Porphyry)	41	0.65	Pub. in Noranda's 1984 Annual Report.
	Lakeshore	Sulfide (Tactite)	9	1.35	Pub. in Noranda's 1984 Annual Report.
	Lakeshore	Oxide	13	1.16	Pub. in Noranda's 1984 Annual Report.
	Ventura	Sulfide	6	0.26	Reported 1965; with 0.28% MoS
ORACLE RIDGE MINING PARTNERS	Oracle Ridge	Mixed (?)	11	2.50	Reported 1977; with 0.64 oz/ton Ag. Published 1979.

TABLE XXIII CONTINUED

COPPER RESERVE BASE IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
S.B. OWENS	Carlota	Oxide	4	0.85	Reported 1979.
PAPAGO TRIBE	Vekol Hills	Sulfide	105	0.56	Pub. 1978, minable by open pit, with 0.014% Mo; 16 million tons oxide Cu.
PHELPS DODGE CORP.	Copper Basin	Sulfide	175	0.55	Pub. 1974; minable by open pit with 0.02% Mo.
	Morenci/Metcalf	Sulfide	795	0.75	1985 Annual Report.
	New Cornelia	Sulfide	209	0.50	1985 Annual Report.
	Safford	Mixed	262	0.88	1985 Annual Report.
	Western Copper	Sulfide	184	0.64	1985 Annual Report.
PINTO VALLEY COPPER CORP.	Miami East	Sulfide	6	3.14	Pub. in Newmont Mining 1985 Annual Report
	Pinto Valley	Sulfide	355	0.40	Pub. in Newmont Mining 1985 Annual
V.A. SMITH ESTATE	Dynamite	Mixed	100	0.53	Unpublished estimate.
SQUAW PEAK COPPER	Squaw Peak	Sulfide	30	0.35	Unpublished estimate.
STANDARD METALS CORP.	Antler	Sulfide	5	1.95	With 4.13% Zn, 0.94% Pb, and 1.05 Ag oz/ton. Pub. in 1978 Annual Report & Form 10-K.
STEWART TITLE AND TRUST & TSC ENTERPRISES	Emerald Isle	Oxide	1	0.40	3 million tons at 0.1% Cu USBM RI 8236, Pub. 1977.
VAN DYKE COPPER CO. & SHO-ME COPPER CO.	Van Dyke	Oxide	100	0.50	Pub. 1977.

TABLE XXIII CONTINUED

COPPER RESERVE BASE IN ARIZONA 1/

TOTAL COPPER RESERVE BASE IN ARIZONA

Sulfide	4.353	Billion	tons	at	0.63%
Oxide	.805	"	"	"	0.50%
Mixed	3.015	"	"	"	0.61%
TOTAL	8.173	"	"	"	0.61% or 50 million tons of Copper

1/ **Reserve Base** -That part of an identified resource that meets specified minimum physical and chemical criteria related to current mining and production practices, including those for grade, quality, thickness, and depth. The reserve base is the in-place demonstrated (measured plus indicated) resource from which reserves are estimated. It may encompass those parts of the resources that have a reasonable potential for becoming economically available within planning horizons beyond those that assume proven technology and current economics. The reserve base includes those resources that are currently economic (reserves), marginally economic (marginal reserves), and some of those that are currently subeconomic (subeconomic resources).
"Mineral Facts and Problems" 1985 Edition, Bureau of Mines Bulletin 675, page 3

TABLE XXIV

ARIZONA AND U.S. COPPER MINE PRODUCTION IN SHORT TONS OF Cu, 1874-1985

Period	AZ Production 1/	Cumulative AZ	U.S. Production 1/	Cumulative U.S.	AZ % of US Prod. Ann'l	AZ % of US Prod. Cum
1874-1971*		24,889,171		60,365,183		41.2
1972	847,929	25,737,100	1,664,840	62,030,023	50.9	41.5
1973	867,506	26,604,606	1,717,940	63,747,963	50.5	41.7
1974	804,904	27,409,510	1,597,002	65,344,965	50.4	41.9
1975	751,489	28,160,999	1,413,366	66,758,331	53.2	42.2
1976	956,215	29,117,214	1,605,586	68,363,917	60.0	42.6
1977	852,620	29,969,834	1,503,964	69,867,887	56.7	42.9
1978	908,835	30,878,669	1,496,482	71,364,363	60.7	43.3
1979	957,251	31,835,920	1,591,200	72,955,563	60.2	43.6
1980	760,926	32,596,846	1,301,900	74,257,463	58.4	43.9
1981	1,071,949	33,668,795	1,695,500	75,952,963	63.2	44.3
1982	848,750	34,517,545	1,264,322	77,217,285	67.1	44.7
1983	747,604	35,265,149	1,144,306	78,361,591	65.3	45.0
1984	791,275	36,056,424	1,198,186	79,559,777	66.0	45.3
1985 (Prelim)	889,157	36,945,591	1,203,900**	80,763,677	73.9	45.7

* For Cumulative Breakdown 1874-1911 and Annual Production 1912-1971, see "The Copper Industry" by Ken Phillips, published Feb. 1973 by ADMMR.

** Non-Ferrous Metal Data - 1985.

1/ Source: "Mineral Yearbook-Area Reports: Domestic", U.S. Bureau of Mines.